ANNUAL REPORT

OF THE

DEPARTMENT OF REVENUE SETTLEMENT AND AGRICULTURE

FOR

1885-86.

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DEPARTMENT OF REVENUE SETTLEMENT
AND AGRICULTURE,
MADRAS, 15*th September* 1886.

No. 2833.

FROM

J. GROSE, ESQ.,
Acting Third Member, Board of Revenue, in charge office of Director of Revenue Settlement and Agriculture.

TO

H. E. STOKES, ESQ.,
Secretary to Government, Revenue Department (through the Board of Revenue).

SIR,

I have the honor to submit the report for the past official year on the administration of the departments under the control of the Director.

2. Mr. Price joined the department as Acting Director on the 8th of April 1885, but left it in October last on his appointment as Acting Secretary to Government in the Revenue Department and did not rejoin it till the beginning of July last.

3. The operations of the Revenue Settlement and Inam Departments have already been separately reported upon, and the review of the irrigation accounts will be submitted at an early date. It is therefore only necessary to refer to these subjects very briefly.

4. *Settlement Department.*—The operations of this department were conducted in the districts of North Arcot, Madura, South Arcot, Malabar (the Wynaad) and Bellary. In the last-named district the classification of the Adóni taluk and of a portion of the Allúr taluk was completed. The settlement of the remaining portions of the North Arcot district was finished last April. In the Madura district, for which a scheme of settlement was approved by Government in July 1885, the revised rates were introduced in the Palni taluk. In South Arcot, the classification work was proceeded with. A revised scheme for the settlement of the district was received from the Deputy Director and submitted to the Board of Revenue, who have, however, returned it for further revision. In the Wynaad, the inquiry into janmam claims to escheats was completed in the Ellorenad, Nallurnad, Edavaka, Periah and Thondarnad amshoms. A scheme for the settlement of the Wynaad has recently been sanctioned by Government and work has been started from the beginning of the current month.

5. The department has been at work now for twenty-eight years. During this period it has dealt with 13,175,161 acres. The cost of the survey (Rs. 10,388,969) and settlement (Rs. 66,54,140) operations up to 31st March last has been Rs. 1,70,43,109. The increase of assessment, due to re-settlement, was Rs. 17,10,744, being a return of more than 10 per cent. on the outlay. In the year under report, the expenditure was Rs. 2,66,055 or Rs. 23,705 less than in the year preceding it. The area dealt with was 211,620 acres or about 331 square miles. The cost of the survey operations was Rs. 74,195 and the outturn of work was 1,645 square miles of revenue survey and 1,614 square miles of topographical survey.

6. *Inam Department.*—During the year 33,143 acres of inam land, the full assessment of which was Rs. 47,034, were enfranchised on a quit-rent of Rs. 31,263.

7. The number of title-deeds issued was 3,043, of which 2,808 were for village service inams, 179 for religious and charitable institutions, and 56 for personal grants.

8. The Special Deputy Collector conducted inquiries in the Harpanahalli, Hadagalli, Ráyadrug, Adóni, Allúr, and Bellary taluks of the Bellary district, and in the Palmanér taluk of the North Arcot district.

9. Since its constitution, twenty-six years ago, this department has dealt with 6,806,798 acres, the full assessment of which was Rs. 1,07,80,606. The financial results of its operations up to 31st March last were, including the assessment of inams that were resumed and fully assessed, an addition of Rs. 18,89,025 to the revenue, obtained at a cost of Rs. 14,22,876, a sum which is less by Rs. 4,66,149 than one year's income of the department.

10. *Irrigation Accounts.*—These will be reviewed and submitted to Government in due course.

11. *Department of Agriculture—I. Organization and maintenance of village records.*—In the preceding year it was directed by Government that, from April 1885, all candidates for appointment as Revenue Inspectors, as well as all officers of that grade aspiring to promotion, should pass the Revenue Test, Lower Grade, and that, from and after April 1888, they should, in addition, pass a special test in surveying. During the year, the scheme of the survey test to be passed was laid down and rules were prescribed affording facilities to existing revenue inspectors and candidates for the post for acquiring the necessary practical knowledge to enable them to pass the test.

12. The committee appointed to revise the manuals of village and taluk accounts have finished their labors and the forms of accounts proposed by them have been approved by Government who have directed their adoption, subject to report at the end of three years.

13. *II. Analysis of districts with reference to security from famine.*—It is a matter for regret, that for various reasons, it was not found possible to make any progress in the preparation of the analysis of districts with reference to their security from famine. An analysis of the Kurnool district was made from such data as were available, and the Government approved of it in October 1885. But though it was complete so far as it went, it required to be verified and supplemented by local inquiries and direct observations. This could not be done without a staff of local agricultural inspectors, who could, under proper supervision, make the necessary inquiries in the districts and collect the requisite information. Government accordingly approved Mr. Wilson's recommendation for the entertainment of a number of district agricultural inspectors to work under the orders of the Assistant Director of Agriculture. It was, however, impossible to appoint the men at once, because there was no provision in the budget of the department and no fresh allotment could be obtained on account of financial pressure. Seven agricultural inspectors were, however, taken on in the beginning of the current year. Five of them are working in the Kurnool district with reference to the famine analysis. One is now in the Kistna district, inspecting lands suited for experiments in diversified cropping and will, after the completion of his work in that district, proceed to the Godávari district on similar duty. Another inspector is posted on the Nílgiris to supervise the wheat and barley experiments which will be referred to later on. Mr. Benson himself has spent about six months in the Kurnool district observing the agricultural condition and practices of six out of its eight taluks and collecting information for the completion of the analysis.

14. Three temporary clerks have also been added to the Central office to expedite the preparation of the analyses of districts similar to that of the Kurnool district. They have been collecting statistics in connection with the Bellary district.

15. The principles on which the analysis of districts should be drawn up formed the subject of much discussion and correspondence and Government passed final orders on the matter in G.O., dated 25th June last, No. 528. I do not think, therefore, that paragraphs 5—10 of Mr. Benson's accompanying report were necessary.

16. In paragrah 11 of his report, Mr. Benson remarks that it is not "sufficient to prepare an analysis of each district and then to leave it, but we must provide for the maintenance of our information abreast of the time." He considers that, for this purpose, it will be necessary to station an agricultural inspector permanently in each district. The matter is an important one; but the disposal of it may be deferred until Mr. Benson completes his analysis of the Kurnool district and submits it for the approval of Government.

17. *III. System of collection of revenue and rental in precarious tracts.*—There is nothing special to record under this head.

18. The question of the revision of the kistbundy or land revenue instalments, referred to in paragraph 13 of the last report, is still under the consideration of Government.

19. In the Chingleput and South Arcot districts much damage had been caused to the crops by excessive rains. The Collectors were authorised to, at their discretion, suspend collections in such portions of their districts as were affected.

20. In parts of the Ganjam district the crops failed on account of want of rain and there was distress among the agricultural population. Work, however, was found for them on the Chilka Lake canal and Rushikulya project and the Collector was authorised to suspend the collection of both ryotwari assessment and zemindari peishcush.

21. On the Nílgiris and Shevaroys, the planters had suffered on account of leaf-disease and depression of trade and were unable to pay up their assessment. Discretion was allowed to the Collectors concerned to postpone the realization of the Government demand in all cases where they thought that the indulgence was necessary.

22. *IV. Measures of Protection—Fodder Reserves and Arboriculture.*—I have not been able to obtain any information regarding the area of reserved forests and reserved lands.

23. *Reclamation of sandy waste.*—Mr. Benson says that the plants of *Atriplex Nummularia* or Australian Salt Bush referred to in the report for 1884 were raised in the Botanical gardens of the Agricultural College and that the few planted out in the farm land were destroyed by floods. It is not stated how the plants, if any, standing in the Botanical gardens, are doing. It was hoped that the Forest and Salt Departments would be able to find indigenous salt bush plants in different parts of the presidency, but nothing has apparently been done by either.

24. *Edible Cactus.*—Some two cart-loads of this plant having been supplied by Mr. DeSalis to the Agri-Horticultural Society, Madras, the society was kind enough to offer to distribute plants to Collectors. Accordingly 150 plants have been sent very recently to the districts specified in the margin. The results of the experiments will be laid before Government in due course.

1. Nellore.	8. South Arcot.
2. Cuddapah.	9. Tanjore.
3. Anantapur.	10. Tinnevelly.
4. Bellary.	11. Salem.
5. Kurnool.	12. Malabar.
6. North Arcot.	13. Madras.
7. Chingleput.	

25. *Malta Lime.*—Orders have recently been received to try if this useful species of fruit-tree will succeed in this presidency.

26. *Diversified cropping.*—Government approved of certain proposals made by Mr. Wilson to grow on lands, hitherto cultivated with paddy, other crops which either do not require any irrigation at all or do not, at all events, want such an abundance of water as paddy does. The object of the proposed experiments was to ascertain—

(*a*) Whether the irrigable area of the presidency cannot be extended;
(*b*) Whether the loss which the ryots now suffer by the destruction of their paddy crop by attacks of insects or fungoid diseases cannot be averted, or at all events mitigated by thus substituting other crops for paddy.

The experiments were to be conducted through the agency of private individuals who would be indemnified for any loss sustained by them in consequence of the experiments. Great difficulty has, however, been experienced in securing lands of the description required and the experiments have not been started yet. The Collectors of the Kistna and Godávari districts have recently reported that certain substantial ryots of their districts are willing to make the experiments on the conditions laid down. An agricultural inspector has therefore been deputed to inspect the lands and report upon their suitability for the purpose in view. If they fulfil the conditions of situation, drainage, &c., laid down, the experiments will be made and the results reported in due course.

27. *Extension of Communications.*—The Bellary-Kistna and Cuddapah-Nellore State Railways are in progress. It is expected that the former will be completed by the end of 1888 and the latter by that of 1887. The Calicut extension of the Madras Railway is in rapid progress and will probably be completed by June next year.

28. *Irrigation.*—The only important new project sanctioned during the year is the Periyar project, which, when completed, will greatly benefit the Madura district. Work, however, can be commenced only when funds are available.

29. *Minor Irrigation Works.*—The year's allotment for the up-keep of minor irrigation works in the presidency was Rs. 2,76,000. The actual expenditure was Rs. 2,56,272 or about 93 per cent.

30. *Advances to Agriculturists.*—The rules proposed by the local Government under the Land Improvement Loans Act XIX of 1883, and the Agriculturists' Loans Act XII of 1884 received the sanction of the Governor-General in Council, and the two Acts, with the rules thereunder, were brought into force in this presidency, the first-named Act with effect from 1st July last and the other from the beginning of the current official year. Two sets of rules have been issued under the first-named enactment, the one applicable to land improvements of all kinds throughout the presidency, and the other only to the construction of wells in the districts most exposed to drought. The rate of interest on loans under the first set of rules is generally $6\frac{1}{4}$ per cent. which, however, may be reduced or remitted altogether by the local Government. Under the special rules for irrigation wells in dry districts, the rate of interest is 3 per cent. There is no limit as to the maximum amount of loan under the general rules, but under the special rules loans cannot exceed Rs. 750.

Under the Agriculturists' Loans Act also two sets of rules have been issued, one providing for advances for—

(*a*) the purchase of seed-grain and ploughing cattle ;
(*b*) rebuilding houses destroyed by fire or flood ;
(*c*) any other purpose not specified in the Land Improvement Loans Act but connected with agricultural objects.

The other set of rules relates to advances to ryots during seasons of distress to enable them to subsist until the ripening of the next harvest. The maximum amount of advances under the first set of rules is Rs. 1,000, bearing interest at $6\frac{1}{4}$ per cent. which, however, the Government can reduce or forego altogether according to the circumstances of each case. Advances under the second set of rules are not to exceed Rs. 200 and no interest is charged on them.

31. *Native Arts and Manufactures.*—Mr. Havell, the Superintendent of the School of Arts, made a tour towards the close of the year under report in the districts of Ganjam, Vizagapatam, Godávari and Kistna, visiting all the important seats of arts and manufactures therein. He has submitted a very interesting report describing the kind and condition of the several industries carried on in those districts. The report itself will shortly be published *in extenso*, but the following brief notes on the condition of the various industries may be usefully made here :—

Cotton-weaving.—With some few exceptions there has been a steady and continuous decline in numbers in every district. The falling off is, Mr. Havell believes, chiefly in the class of inferior weavers whose goods have been replaced by machine-made cloths.

Cotton-printing has declined to, perhaps, a greater extent than any other industry.

Silk-weaving.—There has been a decline in numbers.

Carpet-weaving.—There has been, within the past four years, a diminution in the number of workmen employed, attributed to a falling off in the foreign demand, caused probably by the general commercial depression in Europe.

Of artisans, goldsmiths are the most flourishing, as they are not affected by any foregin competition. Mr. Havell observes that, so far as the manipulative process is concerned, "the native weaver is often a highly-skilled workman and little improvement is likely to be effected in this direction." If, however, it were possible to introduce an effective but simple hand-machine for spinning which would combine the advantages of the more rapid production and evenness of thread of machine manufacture with the quality of durability which country cotton now has, it would materially improve the position of the native weaver, by enabling him to dispense with the imported twist and to obtain a material the quality of which would give his cloths a decided advantage over those made of machine-spun thread.

As regards carpets, Mr. Havell considers that, though the ordinary Ellore and Masulipatam ones of small size prepared for the country bazaars are of inferior stuff and badly made, the best patterns in use made to order "are not inferior to those of old South Indian carpets which are held up to the disparagement of modern productions.

"Aniline dyes are very rarely used as they are at Warangal and other places in Hyderabad, and I have seen carpets from the native looms at the three seats of the industry—Ellore, Masulipatam and Ayyampet (Tanjore)—which are in no respect inferior to old specimens in the hands of connoisseurs in London or in native houses and palaces."

32. *V. Agricultural experiments including Farms—The Government Farm at Saidápet.*—The Government Farm, *quâ* farm, was, as decided in G.O., dated 5th May 1885, No. 532, closed on 1st September of the same year. A portion of it was transferred to the School of Agriculture as an *annexe* to be worked for demonstration purposes. A portion of the dead-stock was handed over to the School of Agriculture, and the remainder, after retaining what was required by this department for purposes of exhibition, &c., was sold by public auction. Of the live-stock, a few have been distributed to private gentlemen who take an interest in agricultural improvements and in cattle-breeding, but the major portion has been retained, pending the selection of a suitable site for a stock-depôt which will be referred to presently.

33. *Private Experimental Farms.*—Of these only two now exist, viz., those at Madura and Karúr. Both are in good condition. The Agri-Horticultural Society of Narsápur, if it still exists, is apparently not in a very satisfactory condition.

34. *The Eurasian and Anglo-Indian Settlements.*—Mr. Glenny, when acting as Director, visited the settlements in the Mysore territory formed by the Eurasian and Anglo-Indian Association of South India and found them in a prosperous condition. The settlers are men of moderate means and have taken to cultivating the ordinary cereals of the country, fruit and vegetable growing, preserving, poultry-farming, pork and bacon curing, &c. Mr. Glenny obtained the permission of Government to lend, for the common use of the settlers, an Aden bull and a donkey stallion.

35. *Ploughing Matches, Exhibitions, &c.*—In G.O., 20th February 1885, No. 220, Government approved of the recommendation of the committee who managed the ploughing match held in Madras that similar exhibitions should be held in the mofussil. A committee of numerous competent authorities considered the matter and settled a programme, a copy of which is annexed to Mr. Benson's report. The Assistant Director considers that plough trials are not likely to succeed in the mofussil.

36. The greater portion of the provision made in the last year's budget on account of ploughing exhibitions had to be surrendered on account of the financial pressure. With the small balance of Rs. 200, arrangements were made to get up a ploughing match at Kurnool in December last. There was a large gathering of ryots from considerable distances in the district to witness or compete in the match and much interest in the proceedings was evinced, but the competition was poor.

37. In this connection I must refer to a fact of great promise. A student of the School of Agriculture, by name Sami Aiyangar, the son of a well-to-do Brahman landholder in the Tinnevelly district, undertook to spend his school recess in the months of July and August 1885, in holding, in his native district, a series of ploughing demonstrations wherein he showed the advantages of using improved ploughs practically. A large number of ryots witnessed his demonstrations and showed much interest in them. A demand for the improved ploughs arose, which, it is understood, a local agricultural association has taken steps to meet by local manufacture. Government expressed their satisfaction with Sami Aiyangar's efforts and directed his report to be printed and laid on the Editors' table. His travelling expenses were paid and a further sum of Rs. 200 was placed at his disposal to enable him to conduct similar demonstrations during his recess in July and August last. A sort of travelling ploughing show was then held by him, under the supervision of the Assistant Director, Mr. Benson, in the South Arcot, Tanjore, Trichinopoly, Madura and Tinnevelly districts. The leading firms engaged in the manufacture and sale of agricultural implements furnished patterns for exhibition and made arrangements for carrying with the party a stock of implements in order that ryots might be supplied with such patterns as met with their approval.

38. *Agricultural Exhibitions.*—On account of the unfavorable character of the season, another year has been allowed to pass away without any mofussil agricultural exhibitions. Rs. 15,000 have been provided in the current year's budget and it is hoped that it will be found possible to arrange for exhibitions at Erode and Gooty before the close of the year.

39. The Farmer's Club, Madura, held an agricultural show in their town on the 1st, 2nd and 3rd of May 1885. The show was successful, its leading features being—

(1) The successful shade-drying of tobacco.
(2) The promising efforts of farmers and machines towards the improvement of agricultural implements, water-lift, locks, &c.
(3) The success of a farmer in taking a prize for Guinea-grass raised from shoots supplied from the Madura farm,
(4) The substantial profits made by the farm from the sale of milk and vegetables.

40. The Government gave a grant-in-aid of Rs. 500 towards the expenses of the show and expressed their readiness to make a similar contribution for a similar exhibition in the current year. None, however, has been held.

41. Government sanctioned a similar grant of Rs. 500 for an agricultural show which it was proposed to hold at Rajahmundry. But the grant had to be withdrawn as the idea of the show was abandoned.

42. *The Colonial and Indian Exhibition, London.*—For this exhibition a collection of cocoons, raw silk, silk fabrics, indigo cakes, and tobacco leaves and cigars was contributed by this department. This was independent of the exhibits forwarded by the Forest Department and by the Provincial Committee appointed by Government.

43. *Saidápet Farm.*—No work having been done in the farm as it had been decided to close it on the 1st September 1885, there is little to record under this head. Mr. Benson's report, herewith submitted, describes what little was done and alludes to several other subjects on which a few brief remarks are offered below :—

Paragraphs 5 *to* 11, noticed above, describe how the analysis of districts should be drawn up and what steps should be taken to keep the recorded information up to date.

Paragraph 12 dwells on the worthlessness of our statistics of agricultural stock. It cannot be denied that they greatly understate the number of cattle, &c., and are therefore not of much value as statistics. This defect has long been recognised, and Government have, in a recent order (G.O., No. 539, dated 30th June 1886), directed the Collectors of certain selected districts to personally and through their divisional officers test, without previous warning, in a few selected villages, the accuracy of annual statistics of cattle stock by comparing the return last prepared with that of the preceding year and, if possible, taking a census of the cattle of the village concerned.

It is noted that Mr. Benson's observations in the Kurnool district have led him to the conclusion that "the cropping returns, with certain reservations, will give us some general ideas not far from the truth."

Paragraph 17.—Adverting to the last sentence of this paragraph, I have only to observe that there is no longer any room for doubt as Government have, in G.O., dated 1st April last, No. 258, directed that "the Assistant Director shall, in the case of all up-country ploughing matches held from agricultural funds, be *ex-officio* member and Vice-President of the Managing Committee, and that the Collector, who should *ex-officio* be President, shall consider the Assistant Director as being, for the time, his professional adviser in the matter of the site and season at which to hold the match."

Paragraphs 22 *to* 24.—Here are recorded the results of the experiments made with the American Sugar Mill and Cook's evaporator. The experiments have not led to any definite conclusion. These machines were obtained principally with a view to test the sugar-producing quality of the *Sorghum saccharatum.* They will now be sent to the South Canara district for this purpose.

Paragraphs 25 *to* 27.—These relate to the question of cattle and sheep breeding, and I shall refer to this subject later on.

Paragraphs 44 *to* 47 contain an interesting account of the stock distributed by the farm during the past few years. Government will probably consider the results on the whole satisfactory.

Paragraph 48 refers to the question of ensilage on which the Government have recently passed orders directing experiments to be made on a large scale.

Paragraphs 49 *to* 51.—Mr. Benson refers again to the policy under which it was decided to close the Government Farm at Saidápet and to abstain from establishing any similar institution for the present. As the policy alluded to has been recently decided after long and careful consideration of the arguments for and against it, I consider it unnecessary to say anything on the subject here.

Paragraph 74.—Mr. Benson considers that in view of the unsatisfactory results of experiments with seeds distributed by the department, due in a great measure to the want of aptitude, knowledge or time on the part of the officers to whom the conduct of the experiments is entrusted, it would be desirable to restrict the distribution of seeds. His attention will be drawn to paragraph 10 of G.O., dated 11th January 1886, No. 20.

Paragraph 96.—On the subject of the formation of a Museum for a collection of agricultural implements to be located at the School of Agriculture, Mr. Benson will be requested to formulate his proposals, and a separate communication will be submitted to the Board and Government. I am not sure, however, if it is necessary for this department to take any action in this direction as it would appear from the papers recorded in G.O., dated 8th January 1886, No. 17, Educational, that it is intended to make a collection of implements of the kind proposed by Mr. Benson for the school of Agriculture, and this will probably be arranged for by Mr. Robertson.

Paragraph 98.—In this paragraph Mr. Benson gave a list of the agricultural bodies and institutions who have been kind enough to send their publications in exchange for those of this department; as the list is a very long one and one which it would serve no useful purpose to publish I have omitted it.

Paragraph 99.—Mr. Benson recommends the formation of a library of agricultural works for the use of the Agricultural department. On this subject I shall address the Board and Government separately after consultation with Mr. Benson.

44. *Sorghum Saccharatum and Amber cane.*—The feasibility of cultivating these plants in sufficient quantities was established long ago. The difficulty has been to extract sugar from them with the country mill. It was believed that a set of the "Blymyer" apparatus would solve the difficulty, and it has accordingly been obtained. A trial will now be made and the results reported in due course.

45. A spirit of good quality was manufactured by Messrs. Minchin Brothers from *sorghum*. It tasted much like rum, but after being opened for a short time it deposited a gelatinous-looking substance. To ascertain what this was Messrs. Minchin Brothers promised to make further experiments. I learn, however, from a recent communication of theirs that they have not been able to make these experiments yet.

46. *Sale of Agricultural implements.*—I have not been able to ascertain how many implements were sold during the year, as the firms concerned keep no record of sales; but I have no doubt that the demand for improved implements has been steadily increasing.

47. *Fibre.*—As stated in paragraph 56 of the last report, a small consignment of fibre prepared at the Saidápet Farm from Manilla Hemp (*Musa textilis*) had been sent to the India office for valuation. The report on the valuation is given in paragraph 61 of Mr. Benson's report. It was suggested that it would probably be better to spin the fibre into rope whilst still fresh. The results of this experiment are reported in paragraph 62 of Mr. Benson's report from which it will be seen that they were by no means satisfactory.

48. *Silk.*—Some attention has been directed to the question of the possibility of establishing silk industry in this presidency. The trees on the leaves of which the wild silk-worm feeds are found in abundance in most of our districts, and the only question is whether cocoons can be collected or produced in sufficient quantity and whether silk can be reeled from them here, or whether they could be sent elsewhere with profit. With this view some 500 cocoons out of the collection made for the Colonial and Indian Exhibition were sent for trial to Mr. Cleghorn, a gentleman in Bengal who reels silk according to a patent process of his own invention. The cocoons had all been pierced. The result was therefore poor. But fresh and unpierced cocoons collected in the Vizagapatam district were more favorably reported upon and were considered as good as the Bengal ones.

49. In the town of Madras a reeling factory has been established by a company recently formed under the name and style of "the Mylitta Silk Company." It is hoped that this firm will be able to place the silk industry in this presidency on a satisfactory footing.

50. Mr. Donner, Vice-Consul for Belgium, who is apparently connected with the above company and takes great interest in the subject, proposed a scheme under which the tassar worm would be reared by the ryots and wild tribes living on the borders of Government forests on trees growing therein. The proposal has been referred to Collectors and the Conservators for opinion. It is hoped that it will be found possible to do something in the direction indicated as it will establish a new and profitable industry which will divert a portion of the population from agriculture and lighten the pressure on land.

51. *Wheat and Barley.*—English seed wheat of a few varieties had been sent out by Messrs. Oakshott and Co. in 1883 for trial cultivation in this Presidency. It was sown in the districts of Nílgiris, Bellary and Salem, but the experiment proved a complete failure, the seed, in some cases, not having germinated at all, and the plants having, in others, died away soon after sprouting an account of either drought or excessive rain. The failure, however, was due, in some measure at least, to want of proper supervision. The Government therefore decided to repeat the experiment, and directed a further supply of English seed wheat as well as of Punjab wheat to be obtained and tried on the Nílgiris. Seed of both kinds was accordingly obtained, but a considerable portion of the English seed was found on arrival to have lost its vitality.

52. To improve the quality of the barley grown on the Nílgiris and to enable the Badagas to meet the demand for good malt barley which has arisen there, good seed barley was obtained from England and the Punjab and distributed to the ryots.

53. The experiments are conducted by the ryots, but to ensure success and to help the people with advice and instruction, an agricultural inspector, educated in the School of Agriculture, has been posted temporarily at Ootacamund.

54. It would be hazardous to predict the success or otherwise of these experiments. But, judging from the condition of the plants, there is every reason to hope that both English and Punjab barley will succeed. The Punjab red wheat has failed. The condition of the Punjab white wheat and of the variety of English wheat known as "the soft nursery red" is not bad.

55. *Babul (Acacia Arabica) Bark and Pods.*—Trial consignments of the Babul bark and pods had been sent home to see if a market could be found for them there. But there was no demand for them, and it has been decided to sell them for what they may fetch, or if there is no bid at all, to destroy them. Some bark and pods were also sent to Australia. It remains to be seen whether there is any demand for them there.

56. *Tobacco.*—Specimens of tobacco grown in the Godávari district were sent to the Poosa factory to ascertain whether cigars suitable for the European market could be made of it. The report on the results of the experiment is encouraging. The leaf examined showed an excess of saltpetre in the soil on which it was grown, but it burnt well and with a fairly good ash. The manager of the factory thought that it was much better cured than any other Indian leaf that he had seen. He was of opinion that, on the whole, the sample was of good quality, and if grown with more vegetable and less organic manure and properly cured on the American system, the Godávari tobacco would make a good leaf for the European market. Samples of the Trichinopoly tobacco were also sent, but no report has yet been received regarding them.

57. *The Persian Date-tree (Phœnix dactylifera).*—At the instance of Dr. Bonavia, of Etawah, steps have been taken by the Board of Revenue to obtain stones and offsets of this very useful tree in view to establishing it in every district of this presidency. It is confidently expected that the attempt will succeed.

58. *Bee-keeping.*—Nothing has been heard from Dr. Shortt and Mr. Nicholson, of Yercaud, regarding the further experiments which they promised to make in this direction. They have both kindly undertaken to take charge of the Italian bees which Mr. Douglas has offered to send to this Presidency for trial on the hills.

59. *Insects affecting crops.*—Locusts appeared in parts of the Madura and Trichinopoly districts, but did no considerable damage.

In parts of Tinnevelly paddy crops were damaged by two species of insects of one of which specimens were forwarded to the Government of India. They were referred by that Government to the Superintendent of the Indian Museum who identified the insects as a species (*Leptacorisa acuta*) of the order Rhynchota, but was unable in the present state of knowledge of Entomology to suggest any remedies for getting rid of the pest.

60. *VI. Cattle-breeding and Veterinary Inspection.*—The cattle at the farm and the Amrat Mahal cattle stationed in the Madura district were doing well during the year. Those at the farm suffered from epizootic aphtha, but there were fortunately no deaths.

61. *Stock-breeding.*—Allusion was made in paragraph 69 of the last report to the question of the establishment of a stock-breeding farm for the presidency, and it was stated that inquiries were being made to ascertain whether suitable sites were available anywhere in the presidency. Tracts of the description required were reported to exist in the Vizagapatam, Madura, South Arcot, Kurnool, Coimbatore, Malabar and Salem districts. The question was then raised as to whether a stock-breeding farm should be established or whether selected sires should be purchased and placed in selected tracts to be drafted thence when of proper age for use to selected districts or portions of districts where the cattle are poor and need improvement. The idea of establishing a stock-breeding farm was abandoned on the following, among other, grounds:—

(*a*) That it would involve a very heavy initial, as well as annual, outlay ;
(*b*) That it would take a long time to see any results;
(*c*) That, after all, the end might be disappointing as the stock bred might not be of the kind wanted.

62. It was therefore decided to accept the alternative scheme, and when a suitable site for a central depôt has been selected, to depute a competent officer to visit such portions of this presidency and other parts of India as contain good cattle and to purchase a number of good sires as well as a few promising heifers. When a sufficient number of these has been purchased, they will be placed in a central depôt and drafted thence for use when of proper age. No covering fees will be charged, but certificates are to be taken by owners of cows and they are to report to the officer in charge of the bulls, when a calf is dropped. To encourage the breeding of good stock and the use of selected sires, an annual show will, after the lapse of a sufficient time to allow of the young animals growing up, be held and a prize of Rs. 150 will be given for the best sire and the best cross-bred animal exhibited.

Great difficulty has, however, been experienced in the selection of a suitable site for the central depôt. Vizagapatam, Kurnool and the Wynaad have had to be abandoned on account of their unhealthy climate and their inaccessibility, and Coimbatore and South Arcot have been inspected in vain. Other parts of the presidency will now be examined, and it is hoped that it will be found possible to select a suitable site and to commence operations at an early date.

63. One potent cause of the deterioration of cattle in this country is the practice of not castrating bulls until three or four years old and allowing them to breed when too young. It is of course out of the question to compel people to castrate their cattle when they should, but something may be done in this direction by the employment in each district of two or three *salustries*, instructed in the Europeon method, for the purpose of castrating calves for the ryots free of charge. The Government have approved of this suggestion and have now under consideration a scheme for the training of *salustries*. It is also intended to instruct them in the uses of the ordinary indigenous medicinal drugs utilised in the treatment of cattle so that they may be of use to the ryots as general veterinary practitioners.

64. *Horse-breeding.*—In paragraph 70 of the last report it was stated that two Arab stallions had been purchased and sent to the Coimbatore district for breeding purposes. The two stallions were at work in that district during the year under report, and served thirty-four mares; but the results were unsatisfactory, only one foal having been dropped. One of the stallions was found to be suffering from windstroke which completely prostrated him. It was ultimately found necessary to put an end to his sufferings by destroying him. It has been decided by Government to continue the

operations, and this time more systematically and on a more extended scale. Two stallions have recently been purchased and it is intended to buy three more. A professional man, the Deputy Inspector of Cattle Diseases, has been placed in charge of the operations, subject to the orders of the Collector. Breeding operations have been extended to the Hosúr division of the Salem district under the supervision of the Sub-Collector, Mr. Dumergue, who takes great interest in the matter. It is hoped that, under the improved conditions, the results of this important experiment will be more encouraging in the current year.

65. In the mean time, Government have, in view to preventing pony-mares being served by young sires, directed the grant of a present of Rs. 3 for each entire pony brought for castration by the deputy and local inspectors.

66. *Ensilage.*—The late Mr. Robinson, M.C.S., made some experiments in ensilage with satisfactory results. Government have now ordered experiments to be made on a large scale by selected officers who are known to take interest in the question. Funds have been placed at the disposal of these officers, who have been instructed to give the utmost publicity to the experiments and to afford to the general public every opportunity of watching the operations at every stage and to give help and advice to those who wish to try silos. The Forest department has also been directed to construct a few silos in the reserved forests to which the people resort or are likely to resort for grass. Where any disposition to take the silage for use is shown, it will be given gratis. The silage produced by the experiments will in no case be sold without the previous sanction of Government.

67. *Inspection of Cattle Disease and Veterinary Hospital.*—The cattle disease inspection establishment consisted of an inspector, a deputy inspector, seventeen local inspectors and three probationers.

68. The inspector's report, which is herewith submitted, is a record of continued useful work.

69. The veterinary hospital at Saidápet was of great use to the probationers and to the students of the School of Agriculture. Its popularity with the general public seems also to be steadily increasing every year as evidenced by the larger number of animals admitted for treatment, which was 339 in the year under report against 175 in the one preceding it. Of the number admitted 279 or 82 per cent. were discharged cured or relieved, 42 or 12·39 per cent. died and one was destroyed. Seven animals were discharged as "incurable."

70. Some further experiments in protective inoculation according to M. Pasteur's method were made by Mr. Mills, whose interesting report on the subject was submitted to Government. The results tended to confirm Mr. Mills' opinion that the inoculation is doubtless efficient, but that the present arrangements for obtaining the anthracine are expensive and uncertain, and that therefore it could not be generally adopted in India unless the protective fluid can be manufactured here.

71. Mr. Mills made an experiment with hydrochlorate of cocaine to ascertain its value as an agent for producing local anæsthesia. The results were satisfactory and will be found described in paragraphs 22—24 of Mr. Mills' report.

72. Epizootic aphtha, anthrax and rinderpest were the most prevailing cattle diseases during the year. The table below shows the number of cattle that were attacked and the number that died of those complaints :—

Disease.	Number attacked.	Number died.	Percentage of deaths to attacks.
Epizootic aphtha ...	86,274	3,120	3·6
Anthrax	13,542	11,487	84·8
Rinderpest	12,109	6,971	57·5

73. The cattle statistics of the Presidency show the entire number of cattle to have been 17,845,576, of which 126,489 or only ·70 per cent. were attacked and 29,891 or ·16 per cent. died. There can be no doubt, however, that the statistics do not show anything

like the total number of stock in the country and much value cannot be attached to them. Every endeavour will continue to be made to make them more reliable. Government have, as already stated, directed Divisional officers in certain districts to test the accuracy of stock statistics by visiting villages without notice and comparing the returns prepared for the year with those of the preceding year and by taking a census, if possible, of the cattle of the village. It is hoped that this will lead to the improvement of the statistics in the districts selected. There seems to be no reason why, if district officers take the interest they ought to in the matter, the superior officers in other districts also should not, during their frequent tours in villages, undertake a similar verification of this important portion of our statistics. Collectors might be instructed to state in their annual reports in how many villages each tahsildar and divisional officer has examined the stock statistics.

74. *VII. Agricultural and Fiscal Statistics.*—Forecasts dealing with the sowings of the early and late crops and condition and outturn reports dealing with the estimated *probable* and *actual* outturn were prepared and submitted to the Board of Revenue. But there was great difficulty in getting in the returns punctually from all the districts, and there was therefore considerable delay in their preparation and issue. It is hoped that the district returns will be received more regularly in future and that it will be found possible to publish these useful reports in time. The following statement shows the area under each of the principal crops during the year and their estimated outturn. A separate report on the general cropping of the year will shortly be issued.

STATEMENT showing the acreage of the principal crops and their estimated outturn.

Crops.	Extent on which the actual outturn is estimated at—					
	20 annas (bumper crop).		16 annas (average crop).		10$\frac{2}{3}$ annas (middling crop).	
	Extent.	Percentage.	Extent.	Percentage.	Extent.	Percentage.
1	2	3	4	5	6	7
	ACS.		ACS.		ACS.	
Paddy	1,105,885	20·6	1,752,996	32·6	1,723,180	32·0
Cholum	303,083	7·6	1,139,432	28·7	1,580,810	39·8
Cumbu	222,106	9·7	636,371	27·7	973,805	42·4
Ragi	172,173	11·8	539,342	37·0	556,464	38·1
Cotton	114,967	8·9	405,332	31·3	541,100	41·7
Indigo	71,568	25·3	115,554	40·9	66,827	23·6
Sugar-cane	10,765	22·0	16,220	33·2	12,885	26·4
Castor and lamp oil	88,472	15·2	201,485	34·5	204,955	35·1
Gingelly	42,019	8·0	140,220	26·7	169,910	32·4

Crops.	Extent on which the actual outturn is estimated at—*continued.*				Total outturn in lb.	Area sown in 1884-85.
	5$\frac{1}{3}$ annas (bad crop).		Total.			
	Extent.	Percentage.	Extent.	Percentage.		
	8	9	10	11	12	13
	ACS.		ACS.			ACS.
Paddy	797,300	14·8	5,379,361	100	6,500,995,438	5,027,000
Cholum	949,535	23·9	3,972,860	100	1,388,153,773	4,075,000
Cumbu	463,180	20·2	2,295,462	100	752,238,818	2,196,000
Ragi	191,376	13·1	1,459,355	100	697,616,214	1,453,000
Cotton	235,361	18·1	1,296,760	100	39,529,017	1,321,000
Indigo	28,749	10·2	282,698	100	6,497,829	323,000
Sugar-cane	8,967	18·4	48,837	100	1,856,433	47,000
Castor and lamp oil	88,791	15·2	583,703	100	..	528,000
Gingelly	172,783	32·9	524,932	100	Do.	408,000

75. *VIII. Trade and Trade Statistics.*—According to the returns in the office of the Board of Revenue, the total foreign or external trade of the Presidency, including exports to and imports from other Indian provinces, and transactions in treasure and

Government stores amounted to Rs. 19,86,44,405, of which Rs. 11,53,41,373 represented the value of the export trade and Rs. 8,33,03,032 the value of the import trade. The chief articles of export were hides and skins, raw cotton, coffee, cotton piece-goods, cocoanuts, cocoanut kernel, coir yarn and rope, grain and pulses, indigo, oils, seeds, spices, sugar, tobacco and timber and wood. The chief articles of import were apparel, cotton piece-goods, grain and pulses, liquor, metals, twist and yarn, timber and wood and railway materials. The interportal trade of the presidency amounted to Rs. 5,01,99,952.

76. The total value of the trade between British and other territories adjacent (not rail-borne) was Rs. 4,30,69,969 against Rs. 6,95,08,524 in the year preceding it. The value of the export part of the trade was Rs. 2,06,47,986 and that of the import part of it Rs. 2,24,21,983. The decrease was apparently due to the separation of rail-borne traffic from other traffic. The chief articles of export were fruits and nuts, hides and skins, indigo, living animals, metals, oils, provisions, Indian and European piece-goods, rice and paddy, salt, silk, spices, sugar, seeds, Indian and European twist and yarn and tobacco. The chief articles of import were coffee, fibrous products, fruits and nuts, grain and pulses, hides and skins, living animals, metals, oils, opium, Indian and European piece-goods, provisions, seeds, silk, spices, sugar, timber, tobacco and European twist and yarn.

I have the honor to be,
Sir,
Your most obedient Servant,

J. GROSE,
Ag. Third Member, Board of Revenue, in charge
Office of Dir. of Rev. Settl. and Agr.

ANNUAL REPORT

OF THE

ASSISTANT DIRECTOR OF AGRICULTURE.

INTRODUCTORY.

Summary of personal work.

At the beginning of April 1885 I proceeded on privilege leave and was absent till the end of June. The settlement of matters in connection with the closing of the Saidápet farm, as well as the preparation and submission of my annual report for the year 1884-85 chiefly engaged my attention during July. Towards the latter end of that month I proceeded to Shiyáli to visit the estates of Mr. C. Kristnasawmi Mudaliar and was able soon after to submit an interesting report from that gentleman, which has been published. I also paid a visit to the Madura farm and submitted a report thereon which has also been published.

2. Early in September, a scheme for the system to be pursued in drawing up the agricultural analysis or surveys of the districts of the Presidency having been approved of by the Director, I proceeded to Kurnool to make preliminary inquiries. I was called back from the district by telegram for duty in connection with the collection then being prepared for the London Exhibition on the 20th September and remained in Madras at that week till 8th October, when I again proceeded to Kurnool. At the end of October, I had to return to Madras again to despatch the collection to Calcutta and attend a committee summoned to consider certain plough-trial rules. I was delayed in Madras longer than I anticipated, by a proposal to depute me to the Nílgiris in connection with certain barley experiments ; but, leaving again for Kurnool on the 24th November, after attending the Kurnool ploughing matches, I was able to complete in the three following months a general inspection of the six taluks of the district lying to the west of the Nallamallies and returned to Madras on the 26th February.

3. On the 8th of March I proceeded to the Nílgiris to make myself acquainted with these hills, in connection with the experiments with wheat proposed in G.O., No. 1377, dated 16th December 1885. Returning from the Nílgiris on the 17th of March, I left Madras again on the 20th to inspect the site that had been proposed for a Government stock depôt near Panruti in South Arcot. Thence I proceeded to Madura to inspect the farm maintained there by Madura Farmers' Club, and stopped in my way back at Shiyáli to make some experiments with sugar mills and a Cook's automatic evaporator imported from America. All these experiments were conducted with the kind assistance of Mr. Kristnasawmi Mudali, and I shall make some remarks on them in another place. I returned to Madras on the evening of 27th March, and thus closed my movements for the year.

Change of designation.

4. In September last it was determined that, as the Saidápet farm had been closed, it was expedient that my head-quarters should be removed to Chepâk, and at the same time decided to alter the designation of my office from "Agricultural Reporter to Government and Superintendent, Government Farms," to that now in vogue. It was considered that the position offered and given me in 1884 being *quasi*-independent was anomalous, and that the change would be advantageous in regard to control, saving of expense and despatch of business. I was gazetted as Assistant Director of Agriculture, with effect from 1st April 1884, early in October last, on receipt of the Secretary of State's sanction for my appointment as Agricultural Reporter.

I.—The Agricultural Analysis of Districts.

5. It was proposed early in the year that a staff of Agricultural Inspectors should be organised under my orders with a view to carrying out this work in full detail; but, owing to the financial pressure, their appointment had to be deferred. The consequence has been that no great progress has been possible. The Kurnool district has been taken up first as it is the one which suffered most severely during the famine of 1876-77. As already noted, the six taluks lying east of the Nallamallies have been generally examined and many facts regarding the agricultural systems and conditions of them noted.

6. A scheme* for the agricultural survey was approved of in August last, and is given in Appendix I-A to this report. It will be observed that the scheme overlaps and carries into detail much that was originally included in the Famine analysis. The scheme was designed to carry out a "thorough system of agricultural inquiry;" to provide for the "continuous supply of agricultural information" with the object of "maintaining agricultural operations at the highest possible standard;" and to "localise deteriorating influences which require arrangements for their removal or the alleviation of their action."

7. The system which I proposed should be adopted in carrying out the agricultural survey was to map out a district into agricultural divisions according to the prevailing governing agricultural conditions—soil and climate—and then to bring into one view all the information, statistical and observed, regarding each of these divisions. These divisions would not infrequently traverse the boundaries of districts, but the separate portions of them could easily be joined together in dealing with the whole Presidency, or with large sections of it.

8. In the western part of Kurnool the following divisions have been sketched out:—

A. The Sirvel division, of light soils and with many tanks, in the taluks of Sirvel and Nandyál.

B. The Kundu valley division, of black cotton soils devoted almost solely to the growth of cotton and jonna, with some indigo, which lie in the Sirvel, Koilkuntla and Nandyál taluks.

C. The South Erramalli division, of mixed and often light soils lying amongst the hills in the Koilkuntla and Pattikonda taluks.

D. The North Erramalli division of somewhat similar soils lying in the Nandyál and Rámallakót taluks, running as far north as Kalwa and Rámallakót.

E. The Atmakúr division, of light and mixed soils lying in the taluk of that name and north of division A.

F. The Upper Kundu division, chiefly of black cotton soils lying north of divisions B and D and west of E.

G. The Nannur division, of hill lands lying to the west of E and north of D.

H. The Parla division, of black soils lying to the west of the Erramallis in Rámallakót taluk.

K. The Kodamur division, of mixed soils lying to east of division H in the Rámallakót and Pattikonda taluks.

L. The Pyápali division, of light gravelly soils in the Pattikonda and Rámallakót taluks to the west of the Erramallis.

M. The black soil division of Pattikonda, which is an extension of the Alúr taluk black cotton soil country.

9. When the determination of some villages, which I was not able to examine, has been completed, the divisions can be laid down on a map and the compilation and collation of information proceeded with.

10. It must be manifest to any one that general information, applying, as that regarding a taluk often does, to tracts often of large areas with soils and other agricultural conditions of totally different characters, is only likely to mislead; and, if definite information is desired as to the agricultural practices and systems of the

* Since the above was written orders have been received limiting the scope of the inquiry entrusted to me and striking out of the scheme all matters relating to the economic and general condition of the ryots and district. See Appendix I-B.

ryots and regarding the agricultural condition of the country, it must be specifically localised. For instance, in tract A great dependence is placed on tank irrigation and the paddy crops raised under it; cattle are bred in fair numbers locally; wells are pretty freely sunk; and a pair of cattle tills about 20 acres. Whereas, in the adjoining tract B, irrigation of any sort is exceptional and nearly always devoted to garden crops with two marked exceptions; cows are seldom seen in the villages; wells are few; and a pair of cattle tills from 30—40 acres. The cropping in A is, on unirrigated lands, chiefly varagu or arika (*Paspalum scrobiculatum*), horsegram (*Dolichos uniflorus*), korra (*Panicum italicum*), cotton and dry paddy; in B nearly two-thirds of the land carries jonna (*Sorghum vulgare*) annually and nearly one-third cotton, with indigo as the crop next in importance. To throw tracts such as those together, compile the statistics, and deduce conclusions therefrom can only mislead, and can never afford us a guide to action for improvement and cannot enable us to forecast what conditions of season are likely to be specially injurious to the country. Division A depends in a great measure on the early rains, B almost entirely on the late.

11. It will be manifest that to carry out this work thoroughly, considerable time must be allowed, unless a considerable staff is engaged on it; the scope of it is considerably greater than was perhaps originally contemplated in a general manner. Besides this, it will not be sufficient to prepare an analysis of each district and then to leave it, but we must provide for the maintenance of our information abreast of the time. For this purpose it will be necessary to retain one of the inspectors sanctioned for the work in each district as it is completed.

12. My preliminary inquiries have taught me much. They have shown me that our agricultural statistics are in many respects utterly misleading; there is practically no check on the correctness of the entries made by the village curnams and compilation is done in a very loose manner. The maintenance of a regular and distinct record of the village returns in the taluk offices is not practised, and examination of the village returns there is practically none. There is no regular system of entering the details of mixed crops, the practice varying in different taluks and villages; and, as mixed crops form an important proportion of the crops raised in Kurnool, this is a great blot. The forms in use for compiling the village crop returns are often marked by terrible mistakes. The preparation of the stock returns is most loose and casual; young stock appearing or not, according to the idea of the curnams; the stock of inamdars and other people, not Government ryots, is not as a rule entered; and the entries of the stock of Government ryots is as often entered by guess work as not.

The statistics of agricultural stock that exist are therefore, I fear, of but little use for preparing an agricultural analysis upon. I do not believe them to be worth the paper they are written upon, and certainly not the labor expended in compiling them in the villages, and in the taluk, district, and Revenue Board offices.

As regards the cropping returns, with certain reservations, they will give us some general ideas not far from the truth.

II.—Exhibitions.

13. Yet again a third year has passed and no Government Agricultural Exhibitions have been held in the mofussil. The financial exigencies of the year led to the retrenchment of the grant allotted for the purpose of the two annual shows and so the matter dropped. It is greatly to be regretted that this was necessary, as a great deal of good may be anticipated to arise from such exhibitions by stimulating competition and awakening interest and enterprise in the improvement of the agriculture of the country.

14. A show was organised by the Madura Farmers' Club during the Chittrai festival at Madura on the 1st, 2nd and 3rd of May 1885, to which Government contributed a grant of Rs. 500. The show was so successful that it is hoped that it may be possible to establish it as a permanent annual one in future years. During the current year, however, none has been held.

15. For the reason that put a stop to the Government exhibitions, no ploughing matches were held in Madras during the year.

16. A series of matches were held, however, at Kurnool on 4th December, in which a good deal of interest was shown by the people. Unfortunately the season was too far advanced for a really successful set of matches; no really suitable land for the whole series of matches was obtainable at the time; such matches being new to the people, considerable confusion and irregularity was inevitable in carrying them out; the notice given was not considered sufficient by the local authorities, and the distance of Kurnool from the railway prevented competitors, such as Messrs. Massey and Co. and Messrs. Oakes and Co., from exhibiting and competing. Prizes were offered and awarded in the following classes; but, owing to the abovenamed causes and in some cases to the absence of skill and training among the competitors, the work was generally poor:—

I. For the best work in irrigated land, *i.e.*, a swamped paddy field. } A. With any plough. B. With native ploughs only.

II. For the best work on unirrigated land. For similar classes as the above; and

III. For breaking up and reclaiming black cotton soil.

17. No report on these matches was submitted by the committee of management, and certain remarks that I submitted regarding them were unfavorably criticised. My experience at these matches showed me that it is doubtful whether the time has yet arrived for carrying on ploughing matches, properly so called, in the mofussil, and leads me to believe that something more of the nature of ploughing demonstrations is preferable. I am also of opinion that the management of these demonstrations should be definitely entrusted to some one person with such assistance given locally as may be required.

18. A set of rules for the definitive trial of the relative merits of ploughs was submitted to and revised by a committee, which met at Madras in November last, and a copy thereof is given in appendix II to this report. To carry through a trial under such rules will necessitate the presence of a considerable number of persons whose training fits them for the work, and must always be a work occupying considerable time if any large number of ploughs is brought forward for trial. The rules do not apply to, and could not be worked at, an ordinary ploughing match, but, if carefully adhered to, would give results which would very well settle the relative merits of any competing ploughs.

19. We have therefore three systems of operation which can be organised for the exhibition of ploughs—

I. Plough trials—To test the merits of the implements definitely.
II. Ploughing demonstrations—To exhibit the qualities of different implements.
III. Ploughing matches—To test skill in ploughing and at the same time the merits of competing implements.

The first can only be carried out by experts. The second is the system which at present seems suitable for adoption in the mofussil. The third can only be organised where ploughs have already been introduced for some time and probably at present can only be carried out at Madras.

III.—The introduction of Improved Implements, &c.

20. Owing to the absence of funds, and further to the difficulty in one case of inducing any of our skilled ploughmen at Saidápet to go up-country as in former years, it was not possible to organise any ploughing demonstration parties to exhibit ploughs in the mofussil during the year.

Plough demonstration in Tinnevelly.

21. During the vacation of the Agricultural College, a student, S. Swami Iyengar, from Tinnevelly, was granted the loan of the following implements which he took with him to his native district at his own cost and exhibited there with the assistance of the Revenue officers:—

Swedish plough, 29A.	Digging fork.
Hindustani plough.	Indian ryot's plough.
American pattern plough.	Shovel.

His report, together with the Collector's remarks thereon, has been submitted to Government. The chief facts were that demonstrations were held in different places on 53 days and demands for 255 ploughs were registered at the time. An Agricultural Association was formed with the primary object of making and supplying ploughs to ryots at cost price; and, according to the latest information, 100 ploughs, at a cost of Rs. 7 each, have been made, and the association hope, before the next cultivation season begins, that nearly 500 may be brought into work in the district. Such a result, springing from the enterprise and labor of a private individual, deserves record. The department was unable, owing to the circumstances alluded to above, to do more than lend the implements alluded to.

Trial of sugar mills.

22. In September 1884 Government sanctioned the purchase of a sugar mill and a Cook's automatic evaporator from America. It arrived in September last, but no facilities for testing it then remaining at Saidápet, nothing could be done with it there. In February, however, through the kindness of Mr. C. Kristnasawmi Mudaliar, of Shiyáli, a trial of the machine and evaporator was arranged for in March last on some sugar-cane raised on his estate. At the same time several other mills were tried and the comparative results are summarised below :—

Results of a trial of sugar mills made at Shiyáli in March 1886.

Mills used.	Canes crushed.	Time: Occupied in crushing.	Time: To crush 1 ton of cane.	Ratio of time occupied per ton of cane.	Employed: Men.	Employed: Cattle.	Cost of working: Daily.	Cost of working: Per ton of cane crushed.
1	2	3	4	5	6	7	8	9
	LB.	MIN.	H. M.			PAIR.	AS.	AS.
Beheea, 3-roller	352	123	13 0	100	3	1	12	19·5
Do. 2-roller	342	153	16 42	128	3	1	12	25·
Victor (American)	360	84	8 42	67	4	2	20	21·75
Native wooden roller	200	214	36 5	278	6	1	18	82·1

Mills used.	Speed of: Revolution per hour.	Speed of: Miles per hour.	Juice obtained: Measure.	Juice obtained: Weight.	Juice obtained: Per cent. of cane.	Sugar obtained: Weight.	Sugar obtained: Per cent. of cane.	Sugar obtained: Per cent. of juice.	Ratio of sugar obtained per 100 lb. of cane.	Crushing costs per ton of sugar made.
	10	11.	12	13	14	15	16	17	18	19
		MLS.	M. M.	LB.	LB.	LB.	LB.	LB.		RS. A. P.
Beheea, 3-roller	186	1·94	50	200	57	30	8·5	15	100	14 5 0
Do. 2-roller	207	1·84	44½	178	52	24·25	7·4	13·7	87	21 2 0
Victor (American)	120	1·50	46	184	51	27·5	7·6	14·8	89·4	19 2 0
Native wooden roller ..	144	1·80	18⅛	72·5	36·25	9·75	4·9	13·4	57·6	104 12 0

The Beheea mills were worked under every circumstance to promote success, and the figures given show pretty fairly the capacity of both; but the Victor mill was new to every one engaged in the trials and had not been in use before as the Beheea mills had for some time. It will be noticed that the latter mill worked much the most rapidly, but required, naturally, greater power than the other mills; the setting of it was imperfect and the framing on which it rested not perfectly steady. It should, I believe, have been driven at a higher speed. Altogether, I believe, the Victor mill and the 3-roller Beheea mill to be about equal in their efficiency and in the cost of working. In the trials recorded, the percentage of juice obtained was in every case low, but this must be attributed to the cane, which was a small, hard, white cane—*Nanal.* In a small experiment with some large white cane—Bourbon—the three first mills crushed out from 67 to 72 per cent. of juice, which is very good.

23. The efficiency of the native mill is shown by the figures which, however, perhaps exaggerate its bad qualities. The extreme cost of working with this mill is, however, not surprising as the canes have, before they can be crushed, to be chopped

into short lengths and beaten with a mallet to break up the structure, and finally passed twice through the mill, which fully occupies two men in feeding it, and so works very slowly.

24. The Cook's automatic evaporating pan was specially obtained with the object of trying experiments in sugar-making from *sorghum*. It was, however, set up at Shiyáli at the same time as the above trials were made. The working of it was attended with considerable difficulties, as no one at the spot had worked with such an apparatus before, and the printed instructions sent with the pan were the only guide. Difficulties were experienced in managing the fire, and also in controlling the flow of juice over the pan. The results were not entirely satisfactory nor complete, but a good colored consistent syrrup was easily and rapidly made. Further trials at an earlier season of the year are desirable with this apparatus.

IV.—The improvement of our Live-stock.

25. Last year I was able to note that it was an admitted necessity that steps should be taken to improve our live-stock—cattle and sheep. In the year just closed, a step further has been taken, and it has been decided to form a Government stock depôt at which a number of selected sires shall be collected and from which they shall be distributed over a limited area, with the object of replacing the inferior bulls now too frequently used by the ryots for breeding purposes. Inquiries for a suitable place for such a depôt are being prosecuted, but it has been found that the one which was originally proposed for the purpose in South Arcot is not at all suitable, and thus some delay is likely to occur in forming the depôt.

26. Besides this it has not yet been decided what special objective is to be held in view in selecting the sires to be distributed ; whether beef—the dairy or draught, or whether more than one of these objects is to be considered. It will also be necessary to consider the nature of the indigenous stock and the circumstances of the locality where the depôt is placed before purchasing any large number of sires. It is in fact necessary to study before commencing these operations—

(1) The material to be worked upon.
(2) The objects to be attained.

It may be broadly affirmed that, in the present state of South Indian agriculture, we must look chiefly to the natural pasturage of a locality for the support of the stock raised in it. A system of artificial feeding, whether by the growth of special fodders or pasture, or by the use of artificial foods, has yet to spring up before cattle-breeding with successful results can be carried on, except where natural facilities and advantages are to be found for the feeding of stock.

27. These remarks apply equally to the questions of cattle or sheep breeding. In the latter work a very good groundwork has been laid in the Saidápet flock on which can be reared a good and improving flock for the breeding of rams which will have better wool and mutton producing capabilities than the sheep of this country. The Saidápet flock, however, as pointed in 1881, has reached such a stage where the introduction of blood of superior wool-producing breeds of sheep can be expected to be usefully made. Nothing has been possible in recent years in this direction, but it is to be hoped that it may be found feasible to introduce some merino rams as soon as a depôt for stock-breeding has been formed ; and, by the infiltration of this blood through the Saidápet flock into the sheep of some locality or localities, to gradually improve the wool of indigenous sheep. A great deal of progress has already been effected by selection and management in improving the Saidápet breed, but the introduction of new blood is more pressing than it was in 1882, when the purchase of some merino rams was approved of by Government.

28. As the live-stock maintained at Saidápet has been kept up there during the past year for the objects referred to in the previous paragraphs, I shall relate the facts regarding the herd and flock maintained there in this place. Both are still being maintained there, and their existence is the only reason for the continuance of expenditure in connection with the Saidápet farm.

29. The following table summarises the chief transactions of the year regarding the herd :—

Number of	Cows.			Heifers and calves.		Bulls.		Young bulls and calves.	
	Aden.	Kerry.	Cross-bred.*	Aden.	Cross-bred.*	Aden.	Punganúr.	Aden.	Cross-bred.*
On 1st April 1885	6	1	1	7	2	14	1	9	1
Born	..	..	..	..	1	..	..	4	1
Died	..	..	..	..	..	..	..	1	..
Sold	1	..	..	..	..	..	..	1	..
Distributed	2	..	..	..	..	3	..	1	..
On 1st April 1886	3	1	1	7	3	11	1	10	2

* The cross-breds are—1 cow Aden-Kerry, 3 heifers or heifer-calves, 1 Devon-Kerry, 1 Devon-Aden-Kerry, and 1 Aden-Aden-Kerry, and 2 bull-calves, 1 Devon-Aden, and 1 Aden-Kerry.

30. Of the six cows imported with the Aden bulls in 1882, only three remained on the farm at the beginning of the year. They were—

(1) *Qadir Bi*, which gave during milking period from 17th July 1884 to 19th July 1885 832¼ Madras measures of milk and so far proved an excellent milker, was sent to Mr. C. Kristnasawmi Mudaliar, of Shiyáli in July last, and was then due to calve shortly.

(2) *Hussani Bi*, which had proved only a fair milker, dropped a calf on the 28th July 1885, was sent at the end of August to Mr. Little's farm at Karúr.

(3) *Anur Bi*, which had proved a poor milker and was the oldest of the lot, was sold at the auction held in September last.

31. The three bulls sent out during the year formed part of the lot imported in 1884. Of this lot nine more remained on hand in the end of the year; they have been fit for use as sires for many months past, and are simply eating their heads off at present. The outbreak of foot-and-mouth disease alluded to below, in which they all suffered, caused a loss of condition *pro tem.*, but they have all now practically recovered and are in good condition.

There are two other older Aden bulls still on the farm—one, Rajah, has been used with good results as sire of the herd; the other, returned from the Chittoor farm in July 1885, is not now of much value. Both of these bulls were imported in 1881, and, as they are getting old for use as sires, are now being broken to regular farm work. The Aden, though not a first-class draught animal, proves a very useful one and fully up to working European-pattern ploughs. It was intended to sell the Punganúr bull at the sale of surplus and condemned property last September, but the purchaser of him thereat failed to pay up and he has since been used, as he was previously, for tillage. He is now too old for breeding purposes.

32. Of the young bulls and heifers shown in the table, several are fit for breeding. The Devon cross breds, referred to last year, are doing well, but it is always doubtful whether the crossing of so different a type as a Devon on an Aden is advisable, unless the importation of pure blood can be continued.

33. The number of cows brought by the outsiders and served by bulls kept in the farm was 126. During the months of January and February no cattle were admitted on the farm owing to the prevalence of foot-and-mouth disease. In the previous year 120 cows were served in the 12 months.

34. *The health* of the herd was on the whole good, excepting for the outbreak of foot-and-mouth disease which occurred during January and February. The first signs of the disease were noticed amongst the cows on 9th January; and, in spite of every effort to check it, the disease spread with great rapidity to 29 out of the total stock of cattle numbering 43 head. The treatment of the sick animals was taken in hand by the Inspector of Cattle Diseases and with the care exercised, especially as regards diet

and cleanliness, no losses occurred, nor has any animal been permanently affected by the attack, except one working bullock which after its first recovery relapsed, and has since died.

35. How the disease was introduced on the farm, and why it attacked the cows first, is problematical. It is, however, worthy of note that the working cattle maintained perfect health for a fortnight after the first outbreak, and the sheep flock was not affected at all. This is not the first time in which foot-and-mouth disease has attacked the cattle on the farm and not touched the sheep. At the first appearance of the disease, the sheep flock was removed from the main buildings and kept carefully isolated from the cattle which were attacked.

36. The only loss by death among the cattle was one calf, aged about four months, which died of apoplexy.

37. Two cases of deformed limbs in the calves dropped occurred. In one, the fore fet-locks were stiff and bent-back, in the other the hocks knuckled forwards when the legs were moved. The deformities (or weaknesses) gradually disappeared within about four months after the calves were born.

A lamb was also born with the forelegs below the knees turned inwards and backwards and trailing on the ground. No signs of improvement have occurred in this case.

The cause of these deformities is perhaps hard to find. Such have not been witnessed before on the farm to my knowledge. The Inspector of Cattle Diseases suggests a deficiency of phosphates and lime in farm soils. I myself think that it is probably due to overstocking poor land.

Dairy record.

38. The following is a record of milk produced by each cow during the past year, except that obtained from the two cows given away and the one sold during the year :—

Cow.	Sultana III.		Sultana IV.		Baggium I.		Baggium II.		Banu.	
Breed.	Aden.		Aden.		Kerry.		Aden-Kerry.		Aden.	
	MS.*	OLLS.	MS.	OLLS.	MS.	OLLS.	MS.	OLLS.	MS.	OLLS.
April 1885 ..	75	7½	75	6	..		65	2	65	6
May ,, ..	75	6	73	6	..		63	6	70	4½
June ,, ..	73	7	73	3½	27	7	47	0	53	2½
July ,, ..	79	1	39	1	76	0	41	6	52	1
August ,, ..	81	2	2	5	81	5	39	5	13	4
September ,, ..	79	6	..		98	4	15	1	..	
October ,, ..	73	1	56	0	120	1	23	2	22	0
November ,, ..	5	6	93	5	118	6	90	1	60	1
December ,, ..	38	1	89	4½	104	1	91	3	62	0
January 1886 ..	17	2	89	½	35	0	76	0	28	4
February ,, ..	10	4	41	1	22	0	54	3	20	6
March ,, ..	46	4	24	1	69	6	62	0	62	0
Total ..	656	7½	658	1½	753	6	669	5	510	5
Calved	24th Nov. 1885 ..		6th Oct. 1885 ..		15th June 1885 ..		18th Oct. 1885 ..		16th Oct. 1885.	
Periods not milking from ..	4th ,, ,,		4th Aug. ,,		1st April ,, ..		17th Sept. ,, ..		20th Aug. ,,	
to	29th ,, ,,		11th Oct. ,,		19th June ,, ..		23rd Oct. ,, ..		21st Oct. ,,	
Remarks	Suffered from foot-and-mouth disease from 13th January to 18th February 1886.		....		Suffered from foot-and-mouth disease from 14th January to 18th February 1886.		....		Suffered from foot-and-mouth disease from 15th January to 18th February 1886.	

* 8 ollocks = 1 Madras measure = 100 cubic inches.

39. Regarding these cows it may be noted that—

Sultana III in her 3rd milking period from 3rd January 1885 to 3rd November 1886 gave only 806 Madras measures against 1,153 Madras measures in her 2nd period. The cow has not been in good health or condition during the year ; she also suffered from foot-and-mouth disease in January and February, after she had calved for the fourth time on the 21st November last.

Sultana IV continued to give milk during her first milking period till the 4th August 1885 and yielded in all 1,285 Madras measures, which is very good though

spread over sixteen months. She dropped a second calf on 6th October 1885, which however died of apoplexy on 31st January last, and the yield of milk in this period is likely to be very low.

Baggium I, the old Kerry cow, from 19th June to the end of the year, notwithstanding the fact that she suffered from foot-and-mouth disease in January and February, yielded 753$\frac{3}{4}$ Madras measures of milk and is still milking.

Baggium II, out of the last by an Aden bull, in her 1st milking period, from 22nd September 1884 to 16th September 1885, yielded 675$\frac{7}{8}$ Madras measures of milk. She dropped a second calf on 18th October last, and had yielded to the end of the year 397$\frac{1}{8}$ Madras measures of milk, which shows a slight improvement.

Banu, an Aden cow imported in 1881, in the milking period from 21st August 1884 to 20th August 1885 gave 763$\frac{1}{2}$ Madras measures of milk. She calved again on the 16th October last, and had given 255$\frac{3}{8}$ Madras measures of milk to the end of the year, which, though a smaller yield, is partly accounted for by the attack of foot-and-mouth disease from which she suffered.

40. The system of management pursued with the sheep and cattle was similar in all essential points to that followed in previous years. The following table shows the comparative number of stock maintained, the death-rate, and expenditure for artificial foods during recent years. The price of groundnut cake was very high during the year. Further details are given in appendix III :—

—	Average, 1876 to 1882.	1882-83.	1883-84.	1884-85.	1885-86.
Live-stock maintained, calculated as country cattle ..	115·5	111	91·6	104·4	80·2
Stock, as country cattle, for 100 acres of cultivable time.	77·5	105·7	117·4	144	123
Percentage of deaths	9·7	7·5	4·4	1·68	2·24
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
Cost of artificial food per head per mensem for stock as country cattle	0 11 6	1 4 10	0 13 2	0 10 4	0 12 11

41. To arrive at an idea of the cost of maintaining the farm stock, it is necessary to add the charge for fodder. During the year 22,516 lb. of paddy straw were purchased in addition to supplies available from the farm itself. The following statement gives the approximate quantity and value of fodder consumed :—

Cost of cattle.

—	Quantity.	Value.
	LB.	RS. A. P.
Straw in store at the beginning of the year	127,999	441 0 0
Do. raised and consumed during the year	26,977	96 0 0
Do. purchased	22,516	88 4 0
Green fodder raised and consumed	169,801	566 0 0

Assuming that the green fodder equalled one-third of its weight of dry, the consumption per head of stock, calculated as country cattle, was about 4,130 lb. each or 344 lb. per mensem = 11$\frac{1}{2}$ lb. per diem. This, of course, was supplemented by such grazing as was available on the farm estate.

The total value of this fodder would be about Rs. 1,191-4-0 ; this sum, divided amongst the cattle (equal to 56·7 head of country cattle), would represent a charge of Rs. 1-12-0 per head per mensem. The cost of feeding each sort of stock therefore was for—

—	Bulls and bullocks.	Young stock.	Cows and calves.
	RS. A. P.	RS. A. P.	RS. A. P.
Artificial food	1 3 3	0 13 3	2 13 10
Fodder	3 8 0	1 12 0	4 14 10
Total ..	4 11 3	2 9 3	7 12 8

This, though not an absolutely accurate representation of the cost, is a fair approximation. The charge for the cows includes the feeding of two calves to each for part of the year. Attendance and housing are not included.

Sheep-flock.

42. In the following table the chief transactions of the year that affected the sheep-flock are shown :—

Number.	Rams.	Ewes or gimmers.	Lambs.
At beginning of the year ..	28	71	39
Births	..	..	45
Deaths	3	2	3
Sold	2	8	..
Distributed	4	..	
At end of the year	38	80	43

The lambs of the early part of the year appearing as rams and gimmers at the end. The four rams distributed were sent to Karúr and Madura farm. The flock of breeding ewes was covered by farm-bred rams in September; and 42 ewes produced 44 lambs, the great majority of which were dropped in February. The mortality amongst the lambs did not exceed 2·3 per cent. against 12 per cent. last year. The flock maintained excellent health during the year. The following table shows the average strength and losses of it during the year :—

—	Average.		1883.	1884.	1885.
	1873—1877.	1878—1882.			
Average strength of flock	247	173·8	108·6	120·6	138
Number of deaths	20·6	48·2	4	8	8
Percentage of deaths	8·4	27·7	3·6	6·7	5·8
Rainfall	48·3	48·3	66·1	82·2	47·49

43. The flock, numbering 118 head, exclusive of the 43 lambs dropped during the year (which being under six months old were not shorn), was shorn between the 6th and the 20th April 1886. The outturn of wool is shown in the following statement :—

—	Rams.			Ewes.		
	Number.	Average weight.	Average yield of wool.	Number.	Average weight.	Average yield of wool.
		LB.	LB.		LB.	LB.
Shearlings	19	78·8	2	20	59·1	2·33
Two-shear	1	101	1·5	18	83·94	1·97
Three-shear	4	99·5	1·9	6	75·17	2·00
Aged	14	102·9	2·1	36	77·97	1·85
Average ..	38	90·4	2·3	80	74·39	2·1
Average of all the 118 sheep ..	..	..	..	..	79·6	2·1

The yield of wool for every 10 lb. live-weight, by sheep of different sexes and ages, is tabulated below :—

Sex.	Shearlings.	Two-shear.	Three-shear.	Aged.	Average.
Rams	4·1	2·4	3·1	3·3	3·6
Ewes	6·3	3·8	4·3	3·8	4·3

An error, which it is now impossible to rectify, has evidently occurred in separating the three-shear and aged rams and ewes, but it will be noticed that the average outturn was at the rate of 4·04 oz. of wool for every 10 lb. as compared with 5·1 oz. for last year. Two reasons may account for this ; an earlier shearing and a greater average live-weight amongst the sheep amounting to 15½ per cent. The yield per sheep was, however, lower than last year, the falling off occurring amongst the ewes.

44. *Stock distributed.*—During the past 3½ years the following stock have been distributed, and as far as possible I give particulars regarding them: Aden bulls 9; Aden cows 6 and calves 3; rams 19 (2 returned).

45. One Aden bull sent to the Collector of Malabar died not long after it was sent out. One sent to Dr. Shortt on the Shevaroys is reported as doing well and to have served 32 cows there, but it is added that no native has brought a single cow to be served, although the fact of the bull being available was well notified. Another sent to the Shevaroy Hills Planters' Association is reported to have been of no use whatever; the animal has been well cared for, but perhaps overfed, and the cows are shy and accustomed to run free with the bulls of the herd and not to be brought to the bull for service. Two bulls have been sent to Madura and are now on the farm there; when inspected in March last one was found in good and the other in poor condition; complaints have been received about these bulls not serving cows brought to them, but this was satisfactorily explained by the Inspector of Cattle Diseases and the bulls now serve cows though still rather sluggish in doing so; since the middle of September last one bull has served 13 cows with success in nine cases, and the other 4 cows with success in two cases. Two bulls sent to the Reverend Mr. Little, of Karúr, are located: one on his farm at Uppidamangalam and the other at Karúr; they are reported to be in good condition; the former has served all the cows kept on the farm, but the ryots in the neighbourhood do not bring their cows to be served by him; the other has served some dozen or so cows belonging to the residents of Karúr besides those owned by Mr. Little. Another bull, presented to the zemindar of Arambakam, Chingleput district, has been used by him only recently and is reported to be in good condition. The other bull sent to the Collector of Cuddapah in 1883 and entrusted by him to Mr. Ward of Madanapalle has recently died. He served 12 cows successfully, but of the calves only 7 remain alive, of which 6 are bulls.

Aden bulls.

46. Aden cows were sent to—

Dr. Shortt (1), who reports her to prove a bad milker and to remain in poor condition.

Mr. Little (1), who reports the cow as doing well and to be in calf.

Aden cows.

Madura farm (3), regarding which a report has been furnished and is summarised below. All the cows looked well at the time of my inspection in March last. For the sake of completeness I continue the figures of milk outturn recorded at Saidápet before the cows were sent to Madura at the end of March 1885:—

Cow.	Milked.	Yielded. M.M.	Yielded. OL.
Kazim Bi	From 8th December 1884 to 25th November 1885, and from 28th November 1885 to 31st March 1886 ..	634 246	2½ 5½
Rahiman Bi	From 1st May 1885 to 2nd March 1886	722	1
Muhi-ud-din Bi	From 23rd January 1885 to 11th November 1885, and from 12th November 1885 to 31st March 1886 ..	450 221	4½ 4

The last-named cow had lost her calf before she was sent to Madura; the two cows first named appear to be very fair milkers. Both the first and last mentioned cows were milked far too long.

Mr. C. Kristnasawmi Mudaliar (1), whose letter regarding his cattle is as follows:—

"The cow purchased from the farm at the beginning of 1884 dropped a bull-calf eight months after it was brought down here. She was giving milk one full year at four Madras measures per day for the first ten months and three Madras measures for the next two months. She was then attacked with foot-and-mouth disease and milking was discontinued. She is in dry service at present and is due to calve again in four or five months. The milk she yielded was not only abundant but also rich. The animal is very quite and docile, and no difficulty is experienced either at the time of milking or in the general management.

"With regard to the cow sent to me on condition, I have nothing to say against her except that the yield is very scanty. She dropped a bull-calf on the 31st July and was giving one Madras measure per day for one or two months and also reared her calf. Afterwards she ceased to milk. She was also attacked with foot-and-mouth disease.

"Nothing has been done in the way of breeding by crossing the Aden bull with the country variety. People do not understand the benefit of improving their stock by breeding with superior variety. The cattle that are found in my locality are degenerate, stunted and

weak and fear very much even at the approach of the Aden bull. Hence no improvement has been made in the matter of breeding.

"I have a few Nellore cows. They were crossed by the Aden bull. One of their calves is a good specimen, and I am now raring it with the intention of using it as a sire.

"The cows and bulls get food only once a day, *i.e.*, in the morning. Two pounds of groundnut cake, and a small quantity of rice-bran, rice-gruel in the noontime are given to each per day. Paddy straw is the principal food given for them. No green fodder is available here, and no attempt is made to grow them. In order to improve the stock of my locality, I think a sufficient number of selected country heifers with a few sires of superior breed should be placed under the charge of a trained superintendent. He must look after their breeding and their general management, and we may then hope to obtain good results if sufficient time is allowed for the experiment."

All these cows are held on the condition that the bull-calves shall be held till 12 months old at the disposal of Government for breeding purposes. The calves (3) went out with the cows.

Rams.

47. Regarding the rams distributed, only partial information is as yet available. The tahsildar of Villupuram, who received one, reports that the ram was utilised in 1883, 1884 and 1885, and good number of lambs were dropped to him, which resembled him considerably; he appears to consider the long tails of the lambs a good point. The tahsildar of Sirvel, to whom two were sent, reports that one died and the other is in charge of a village Reddi in his taluk and has been bred from, but that the ryots do not like the long tails. The Coimbatore municipality received one and have raised two lambs, and the ram has been handed over to Mr. Bashiakarlu Naidu Garu. Mr. Little received two and reports that they are doing well and are being used on a flock of about 30 ewes on his farm. Mr. Rathnasabhapathi Mudaliar received one, but does not appear to have made any use of it. Two rams sent to the Sub-Collector of Madura were entrusted by him to the tahsildars of Dindigul and Palni, one each respectively; the former is reported to be disinclined to breed and to have only got one ewe; the latter died in September 1884, after getting four lambs, no further particulars being given. The Sub-Collector, Erode, to whom two were sent states that one appears unable to stand the climate and has not been utilised, and that the other has got 20 lambs and is in good health; of the lambs dropped, however, 18 have died from disease or want of pasturage.

48. *Ensilage.*—It will not be out of place to refer here to this practice. In 1884, when the subject of making some experiments to determine the feeding value of silage products was referred to me, I opposed the expenditure of money on such an object on the grounds that green fodder for silage was not usually available in Southern India; to provide a sufficiency at Saidápet would if difficult, if not impossible then; and that to study the subject thoroughly, the assistance of an agricultural chemist would be required. I also thought the question of the value of silage as a food to be then too unsettled in Europe even to lead us to embark in experiments. Nevertheless, as I said then, there are doubtless places in the presidency where there is a large supply of rank grass available when the sun, heat and dry air required for making hay are not to be had, and in such localities the system of ensilage might and should be adopted with success. As a rule, however, fodder other than the dry straw of his cereal and pulse crops and a limited amount of grass is not collected by the ryot in Southern India, and it is questionable whether until the ryot sets more value on fodder for his stock it is worth while to endeavour to introduce so special a system of preserving it as ensilage. Experience has shown that there are no practical difficulties in making silage, which ordinary care cannot overcome, and also that silage made of good fodder is a good food for stock. Silage made from poor fodder is not superior in nourishing quality to the fodder itself. There is, in fact, a slight loss of nourishing quality during the process of making silage. The greatest benefit is likely to be reaped from the practice when difficulty is experienced in preparing good dry fodder. Such difficulty is not often experienced in South India with natural growths and the raising of special fodder crops is yet a practically unknown custom.

V.—Farming Operations.

Closing of farm.

49. *The Saidápet Farm.*—As related in the last report, Government decided that all direct operations should cease on this farm during the year just closed. The farm, which was originally started in 1866, was closed as such from the 1st September

last. Having been closed on that date, it was not possible that any experimental work should have been carried out during the year; and, owing to facts narrated in the last report, and that the abolition of the farm was, however, to be decided on, no experimental operations were in progress from the previous year.

History of farm.

50. It may not perhaps be out of place to note here a few facts connected with the history of this farm. The site was pitched upon in a haphazard manner, without much consideration as to its suitability. Until 1871 the management of the farm may be said to have been in the hands of amateurs, assisted latterly by a skilled superintendent. In that year a scheme of the objects to be held in view in the experimental work to be done on this farm, and on others which it was then intended to establish in the mofussil, was adopted by Government. This scheme was fairly held in view and many results bearing on the points referred to in it were recorded during succeeding years. As knowledge accumulated, and it must be remembered that at the beginning there was little or no recorded information available of even the most elementary character regarding the conduct of agricultural operations in South India, it was found that the conditions of the farm were not such as lent themselves to further experimental operations, and numerous and extensive alterations were rendered necessary. In 1876 also the Agricultural College was founded and farming operations had to be modified in a great measure, with a view to the teaching of students therein. Besides this, numerous and fruitless discussions continually arose on the subject of commercial and model farming, which caused changes or stoppages in the work of the farm. All these difficulties prevented or delayed any real start being made in respect to experimantal work, such as is being prosecuted in all other agricultural countries where progress is being made.

Want of experimental agriculture.

51. There is now no experimental farm in the presidency. The time, however, has come when it would be possible to begin experimental work in agricultural matters such as is referred to above. Government have decided that experiments in the future shall be carried out with the aid of private individuals. Although in some localities, it may be possible to find substantial cultivators able and willing to carry out experiments, such as have been made at Saidápet in the past, it is not to be expected that we shall as yet find any who are able or willing to proceed with the real work of experimental research in South India agriculture, properly understood. Government have apparently decided that such work is not necessary at this stage. I can only point out the extreme slowness with which results accumulate in experimental agriculture, and that much such research is necessary, if our agricultural inquiries are ever to be really fruitful to the agriculturist of South India.

Records of work at Saidápet.

52. Saidápet farm Records, which were completed in the previous year and published during that now under report, show the nature of the work done on the Saidápet farm during its existence, but not nearly all that was done there, or in connection therewith; for it has been the custom to associate all the operations of Government for the improvement of agriculture in the presidency with the Saidápet farm. Much of this work finds no place in those "Records," although it arose more or less directly from the existence of the farm and was done in a great measure by the establishments connected therewith; and the cost has generally been debited in official accounts against the farm.

53. Seeing that the farm was closed—*quâ* farm—so early in the year, and that the information connected with the live-stock maintained on it has been already recorded, there is but little to add regarding it in this place.

The dry weather.

54. *The Season.*—When the year began in April, there had already been a period of dry weather lasting from 24th December 1884, broken only by a hailstorm in March. The dry weather continued practically till the 15th June, only a few very

small falls of rain having been registered before that date. Between 24th December 1884 and 15th June 1885, only 88 inches of rain fell on nine days. The dry weather was therefore prolonged and severe.

55. From June to September the rainfall was below the average, 12·53 inches having been registered against an average for 15 years of 16·72 inches. A series of good falls between 14th and 19th June might have been utilised for putting in hot-weather fodder crops, which would have been found very useful. The orders then in force, however, prevented this. Following this came nearly two months of exceptionally dry weather ; for, until nearly the middle of August but little rain fell. The remainder of that month was favorable for tillage operations and September followed with a good and fairly distributed rainfall, and had anything been then definitely settled about the farm, it would have been possible to have dealt with it satisfactorily. As things were but little could be done. October followed with a light and well distributed rainfall, and during that month a good deal of sowing was done with the object of raising fodder for the stock. Early in November a heavy fall of rain was recorded, but the regular rains held off again till the 14th, between which date and the 19th 17·92 inches fell, and a good deal of damage was done to some of the standing crops. Then followed a break of fine weather till December 7th, only interrupted by a single shower. This break proved very useful for putting in some fodder crops. December closed this period, usually that of our heaviest rainfall, and during it the amount registered was 33·62 inches or the normal average fall.

June to September.

October to December.

From January to March the weather was normal, but, as the crops were much later sown than usual, they suffered more than they would have done had it been known earlier that it would be necessary to raise any.

January to March.

The total rainfall registered during the year was 47·49 on 68 days against a 15 years' average of 55·14 inches on 67 days. Excepting for the facts that July was an extremely dry month, and that the rainfall in October was very deficient whilst that in November was excessive and badly distributed, the season would have to be termed a favorable one. The weekly rainfall is shown in appendix IV.

The year.

56. *Cropping.*—The arable area was 65·2 acres throughout the year. Such crops as were raised were solely intended for fodder, and, excepting the paddy crops, were cut green. It was only resolved very late in the season to grow any crops at all, and then the time and means available for tillage were not adequate and the crops had to be got in as rapidly as possible. Tilling cattle had to be hired and the work done was not thoroughly efficient. No expenditure was incurred for manures. And, lastly, but little could be done to the crops during their growth in the way of hoeing by hand or otherwise. It is not surprising, therefore, that the outturn of the crops was lower than usual.

General summary.

57. The area under guinea grass and other pasture remained the same as in the previous year. The latter is for the most part still young and only in course of formation. The guinea grass has been standing a long time and yielded no cuttings but only occasional grazing. During the year green fodder was harvested off 58·01 acres to the amount of 169,801 lb., or at an average rate of 2,927 lb. per acre, which is practically the same as that obtained in the previous year. The sorghum crops were very poor, chiefly owing to late sowing and bad weather. The gram crops produced fair outturns, especially those raised after harvesting the cold-weather paddy in 1885. Altogether from 9·58 acres sown at that time 31,656 lb. of fodder were obtained, or at the rate of 3,304 lb. per acre, the rate in the two previous years having been 1,394 lb. and 2,114 lb. Details of these crops are given below.

Fodder crops.

Field number.	Area.	Date of sowing.	Date of harvest.	Duration of growth.	Outturn. Total.	Outturn. Per acre.	Rainfall.
	ACS.			DAYS.	LB.	LB.	INCHES.
29 A, north	·80	21st March 1885.	4th June 1885.	75	786	983	·68
29 A, south	·98	28th Feb. ,,	29th July ,,	151	3,034	3,096	3·92
29 B, III	·41	2nd March ,,	8th June ,,	98	1,640	4,000	·73
29 B	·19	10th ,, ,,	6th ,, ,,	88	1,212	6,379	·71
30 A	2·05	24th Feb. ,,	17th ,, ,,	113	8,164	3,982	1·48
31	1·38	26th ,, ,,	3rd Aug. ,,	158	6,402	4,639	3·97
B 5, B 1 and B 2	·86	21st ,, ,,	30th July ,,	159	5,946	6,914	3·92
36 A	1·10	10th March ,,	10th ,, ,,	122	1,712	1,556	3·37
36 B	·46	27th Feb. ,,	15th June ,,	108	1,074	2,335	·78
36 C	·90	3rd March ,,	15th ,, ,,	104	1,036	1,151	·78
37 A	·45	2nd ,, ,,	6th ,, ,,	96	650	1,444	·71

Early sowing probably caused the increased outturn.

Corn crops.

58. *Unirrigated.*—These were raised as follows :—

Ragi—1·4 acres, failed owing to heavy rains and floods.

Shamai—77 acres, intended for green fodder, produced 303 lb. of grain per acre.

Cholum—2·41 acres, was intended for green fodder, but had so far advanced to maturity before it could be cut that it was considered advisable to let it ripen. The outturn of grain has been 386 lb. per acre.

59. *Irrigated.*—These were solely paddy raised with the object of providing straw for the cattle. The kind sown were chinna sumba drilled in October, car sown broadcast in November, and a little sixty days' sumba raised in the river-bed early in the year. No preparations were made for raising these crops till very late in the year and no nurseries sown. The total area harvested was 18·51 acres, of which 2·61 acres were sown in the river-bed before the beginning of the year. The outturn was 16,653 lb. of grain, 275,126 lb. of straw, or at an average rate of 900 lb. of grain and 4,059 lb. of straw per acre. The rate is about 10 per cent. lower than in the previous year, when a considerable portion of the area raised was occupied by varieties which are of a slower growing and more prolific character. The following statement gives the outturn obtained from each variety of paddy raised :—

Crop.	Area.	Outturn. Total. Grain.	Outturn. Total. Straw.	Outturn. Per acre. Grain.	Outturn. Per acre. Straw.
	ACS.	LB.	LB.	LB.	LB.
Chinna sumba	5·70	4,321	15,404	758·1	2,702·5
White car	5·09	6,241	32,959	1,226·1	6,475·0
Red car	5·90	4,772	21,594	808·8	3,660·0
Sixty days' sumba	1·82	1,319	5,169	724·7	2,840·1
Total ..	18·51	16,653	75,126	899·7	4,058·7

Industrial crops.

60. Nothing was attempted as regards industrial crops, but a few remarks may be recorded regarding those standing from the previous year. A plot of New Orleans cotton, 2·35 acres in extent, was put down in 1884 and yielded during the year 863 lb. of cotton-in-seed, which gave on ginning $246\frac{1}{4}$ lb. of lint; or at the rate of 104 lb. per acre, which is a fair outturn. The crop is still standing and yielded from January to March last 244 lb. of cotton-in-seed.

Two small plots of Nankin cotton, one put down in 1884, and the other a second growth from a crop sown in 1883, gave, respectively, $93\frac{1}{2}$ lb. of cotton-in-seed in 1885 + $89\frac{1}{2}$ lb. from January to March 1886 per acre, and 61·7 lb. in 1884 per acre. These outturns are very low and very poor.

Several fields of indigo were standing at the end of the previous year. The crop in No. 10 was cut for seed in May last, and gave another cutting which was used as green manure later in the year. In No. 12, the crop grew very well, but no sale could be obtained for the green leaf, and it was cut and used as manure in April; a second growth was also used for the same purpose later in the year. The crop in No. 37, as noted in paragraph 82 of the last report, being raised from Cawnpore seed. It throve wonderfully and averaged from 6—12 feet in height with numerous branches. The crop was allowed to seed and the produce, which was only 263 lb., has been distributed. A second growth after this harvest grew almost better than the first and yield 297½ lb. of seed, which, though partially damaged by wet weather before harvest, sold readily at 15 lb. a rupee.

61. *Manilla hemp.*—The plantations alluded to in paragraph 83 of the last report were maintained during the year, but, owing to restriction of expenditure, it was not possible to keep them in proper condition. It will be a great pity to allow this valuable stock to die out.

The following report on some fibre prepared in 1884 was received during the year :—

"*Musa textilis* (Manilla hemp); good length, good color, fairly clean, but mostly deficient in strength; fibre fine, but very brittle; value probably about 30 lb. per ton."

"*Musa paradisiaca* (common plantain).—This sample also is superior to many we have seen, being good length, fair dullish color, fairly clean, varying strength, mostly brittle and weak; if fully equal to sample, would probably realize about 25 per lb. ton."

62. Government, therefore, ordered some experiments to be made in spinning some fibre into rope whilst still fresh, and these were carried out in March last. One hundred and fifty-four trees were taken and after being scraped to extract the sap were part placed in water to steep and part buried in moist sand. After this had been done for the times noted below, the fibre was washed out and as soon as possible spun into ¼″ and ½″ ropes. The following are the results :—

Stems.	Days.	Yield fibre. Total.	Yield fibre. Per 100 lb. of stems.	Rope spun out of fibre.	Remarks.
		LB.	LB.	LB.	
Steeped	10	49·75	12·6	49·25	The fibre was found to be so brittle when spinning that the ropes could not be thoroughly twisted. That from the steeped stems was the more brittle.
Buried	9	36·5	8·0	36·5	
Average	..	..	10·6	..	

It is to be feared that the stems were over-rotted. In appearance the steeped fibre was the better, but the following table, giving the results of testing the ropes, shows that the buried fibre was the stronger :—

Ropes made from fibre.		When weighed with. ——	56 lb.	112 lb.	168 lb.
			IN.	IN.	IN.
½″	Steeped	Stretched	8	10	..
		Broke	..	..	at once.
¼″	Do.	Stretched	7	..	..
		Broke	..	at once.	..
½″	Buried, 1st sample	Stretched	8	..	..
		Broke	..	at once.	..
	Do. 2nd sample	Stretched	6	9	..
		Broke	..	..	at once.
¼″	Buried, 1st sample	Stretched	5	8	in. 10 30″ later.
		Broke	..	..	..
	Do. 2nd sample	Stretched	6	8	10″ after.
		Broke	..	..	suspension.

It was found in these experiments that the cost of extracting the fibre ran up to about 3·6 as per lb.—a price quite prohibiting the extraction of the fibre commercially. As has been noted in previous reports, what is required is a simple machine to squeeze the stems and extract the fibre; such a one has, it is believed, been devised by Major Johnston of Mettupálaiyam, but has not been yet introduced to the public.

63. Inquiries in Mauritius resulted during the year in a decision of Government that, looking at the dangerous character of the machines, it was not advisable to take any steps to introduce the "Cassitêti and "Gratteuse" for the purpose of extracting fibre from the aloe and other plants. It appears also that the extraction of fibre from the aloe is still in its experimental stage in Mauritius.

64. *Paper Mulberry* (*Broussonetia papyrifera*).—The thirteen plants put out in December 1884 in No. 4 field grew fairly during the year, although they did not increase greatly in height. The shrub is deciduous and apparently sheds its old and puts on new leaves between January and March. What will become of this and other valuable plants on the farm after it is finally given up seems doubtful.

65. *Salt bush* (*Atriplex Nummularia*).—The plants alluded to in the report for 1884 were raised in the Botanical gardens of the Agricultural College. A few planted out in the farm land were destroyed by floods. It is believed that the salt bushes so highly valued in Australia as fodder plants grow naturally on high dry stony country and not in salt marshes.

66. *Eucalypts.*—The trees set out in No. 4 field in 1884, which are now nearly two years old, have grown tolerably well and some have attained a height of from 15—22 feet. The varieties which have done best are the yellow mahogany, *E. Tereticornis*, *E. paniculata*, *and E. Citriodora.*

67. The *Divi-divi* trees planted in Nos. 28 and 29 fields continue to flourish and a few in the former flowered again during the year, but only produced a few pods. Those in No. 29 field, owing apparently to shade from surrounding Casuarina trees, though better grown, have not flowered although they are older.

68. The total receipts and charges on behalf of the farm are exhibited below :—

Receipts.	RS.	A.	P.	*Charges.*	RS.	A.	P.
Produce	1,020	10	0	Labor	2,302	8	3
Live-stock	1,073	15	5	Implements	176	10	9
Implements	598	7	2	Manures	58	1	9
Sundries	213	12	6	Seeds	75	15	11
				Live-stock	1,574	6	6
				Sundries	71	15	3
				Establishment	658	4	1
Total ...	2,906	13	1	Total ...	4,917	14	6

The greater part of the excess of charges over receipts was due to the maintenance of live-stock. This will account for Rs. 1,503, if Rs. 1,103 mentioned in paragraph 41 above be added to the net cost of the live-stock as shown in the above figures.

69. There is nothing further to note here regarding the work done on the Saidápet Farm.

70. *Plant diseases.*—The tobacco parasite Bodu—(*Phelipœa Indica*)—which attracted attention in the Godávari district, was found to be common in the tobacco fields of Kurnool. It there goes by the name *Mallé.* It is not known to attack other crops.

In the same district on some of the black cotton soils, a small white flowered plant was observed growing at the root of the white cholum (*Sorghum Vulgare*) plants, and called also *Mallé* by the ryots. Specimens of the plant were preserved and sent to the Government Botanist, and he says :—"The plant is the *Striga densi-flora*; it is a root parasite belonging to the natural order Scrophularinaœ, and like the *Phelipœa*, to which it is allied, is very destructive to certain crops."

Many of the wheat crops in Kurnool were observed to be attacked by smut and often severely so. This crop is there regarded as peculiarly delicate, otherwise its growth might extend. The early cholum crops in the same district were much attacked by rust and considerably injured thereby. The cause appeared to be the excessive late rains and long drought preceding it. The different pulse crops also suffered greatly from various insect attacks encouraged by the cloudy weather that prevailed in December; whilst from the same cause the red-gram (*Cajanus Indicus*) was nearly a failure, although the show of leaf and stem was remarkably fine.

71. *Irrigation experiments.*—The question of how our available supplies of irrigation water may be more fully utilised was under discussion during the year, and Government decided that certain experiments should be conducted with a view to trying whether the system of cropping now generally adopted in irrigable land in this Presidency cannot be beneficially modified. That system may be described as paddy *toujours* paddy, supported in a great measure by the fertilising silt brought to the land in the irrigation water. With the object of clearing the ground and showing how a series of experiments should be devised which would give us data on which to base conclusions, I took the opportunity, offered in submitting a report on the suitability of Mr. Krishnasawmi Mudaliar's estate at Shiyáli for conducting such a set of experiments, to point out what is required. Most of the points, however, that I raised were set aside showing that either I had misunderstood the object to be held in view or that the points I had raised were not understood. Government directed that the experiments should be conducted through private agency under my supervision, and that the Collectors of Kurnool, Kistna, and Godávari should be consulted whether any independent landholders in their districts were willing to conduct the experiments. The Collector of Kurnool has reported that the experiments are not possible in his district on the footing laid down by Government; the Collector of Kistna has reported that several ryots in his district are willing to set aside land for the purpose, but his report is not sufficiently detailed to enable a judgment to be formed whether the land is suitable or not. My observations in Kurnool confirm the opinion of the Collector, and it remains to be seen whether the conditions laid down by Government can be fulfilled. The question of whether these conditions should not be modified is still under discussion, and it is hoped that some decision of what is ultimately to be done may soon be arrived at.

Diversified cropping for irrigable land.

72. *The Madura Farm*, which was started by the Madura Farmers' Club in 1883, has received the support of Government in the pay of a Superintendent since August last. It also received a grant of live and dead stock. The farm was visited twice during the year in July and March; at the time of the former visit, it was found that the farm had been laid out and many permanent improvements, such as wells, roads, &c., made, but it was too early to speak at all as regards results. The season was not a good one.

Inspection.

At the second visit, it was found that, owing to the general state of public affairs at Madura, but little attention had been given recently to the farm by the members of the Farmers' Club, and the forms of account and record sent in November for adoption had not been brought into force. The Government stock on the farm was on the whole looking well at the time, but there appeared to be an attempt to keep too much stock on the small area of poor land available, and enough provision for carrying it through the hot season had not been made.

73. From the information since received, although no regular report has arrived, it appears that the only crops with which any decided success has been obtained are guinea-grass and black cholum. Maize, cotton and tobacco have not done well, the crops raised being but moderate and several failures recorded with each crop, as well as with sugar-cane, paddy, chillies, the sugar sorghums and gingelly. One or two other crops, such as ragi and brinjals, have produced crops. Out of a total area of crop returned as sown or planted of 37·31 acres, 14 acres failed. This is not surprising when the nature and condition of the soil of the farm is considered, and that many of the crops were the first ones put in on the land.

Cropping.

74. The accounts of the farm, as received, may be shown as follows :—

Receipts.	Amount. RS.	A.	P.	Charges.	Amount. RS.	A.	P.
Live-stock	1,194	15	8	Live-stock	593	10	0
Farm produce	257	1	7	Implements	64	14	9
Implements	35	1	0	Manures	19	1	4
Sundries	758	9	7	Seeds	4	9	0
Subscriptions or donations.	3,672	14	0	Labor	748	7	3
				Sundries	25	11	7
				Repairs	34	9	8
				Exhibition	1,028	0	0
				Buildings	368	10	8
				Do. advance unsettled..	1,000	0	0
Total ...	5,918	9	10	Total ...	3,887	10	3

75. *The Karúr Farm.*—Allusion was made to this farm in the last annual report; but Mr. Little not having seen his way to accepting the conditions imposed by Government, no Superintendent was supplied to the farm and the action of the department was confined to the grant of certain live and dead stock for demonstration purposes. It was not visited during the year.

76. *Mr. Kristnasawmy Mudaliar's estate* at Shiyáli was visited twice during the year, and soon after the visit paid in July, an interesting report from that gentleman on the subject of growing sugar-cane and the system of ploughing up paddy land "dry" soon after harvest, instead of leaving it till water can be laid on, was submitted. During the second visit some trials, of a set of American sugar-making apparatus, were conducted. This enterprising gentleman continues to carry on his agricultural operations with the same persistence and enterprise as has been alluded to in former years.

77. *District crop experiments.*—During the year under report the following seed were distributed by the department to Collectors and others for experiment :—

	LB.		BDLS.
Maize	1,485	Guinea-grass roots	5
Sorghum—			LB.
China sugar-cane	425	Sunflower	9
Planters' Friend	143		OZ.
Amber sugar-cane	134	Brinjal seed	7¾
Cotton—			LB. OZ.
New Orleans	513½	Melon seed	2 9½
Nankin	228½	Cumbu }	
Hingunghat	20	Horsegram }	LB.
Sea Island	40	Reana } ... ... each	2
Wheat	497	Corkapilly }	
Barley	100		LB. OZ.
Rye	24	Divi-divi	6 13
Paddy—		Eucalypti	1 13
Carolina	424	Castor beans	3 0
Madagascar	119	Indigo seed	514 0
Tobacco	11	Lucerne	57 8
Manilla hemp plants	276		

A general review of the earlier reports received follows.

78. *Wheat.*—The experiments made with this crop are reported to have failed entirely in South Arcot, Salem, Cuddapah and the Godávari. In Salem, the failure is attributed to the absence of husk on the seed; in Cuddapah, the seed was sown late and the season unfavorable; in the Godávari, the seed, though received in the latter part of 1884, was not sown till June 1885; in Vizagapatam, the seed was rejected as damaged; in Bellary, the experiments were also generally complete failures, excepting one plot at Ráyadrug ·06 acre in extent, and another of ·30 acre at Alúr, which yielded small crops. In Kurnool, also the crops chiefly failed, several were attacked by diseases and only one or two yielded small outturns. On the Nílgiris, owing to the

late arrival of the seed most of the experiments failed; but at Kethy, however, two small plots of ·015 acre each gave, respectively, from—

Dhulia, hard red, 1,000 lb. per acre, } the soil being a red loam and manured
Bakshi, dry, 719 do. } in both cases.

79. *Maize.*—From Cuddapah, the report is similar to that regarding the wheat experiments; in Kurnool, several fair crops of 500—600 lb. per acre were raised; in Anantapur, the best outturn was 400 lb., and the average 163 lb. per acre, the crops being raised on wet land and irrigated. In Bellary failures are again, except in two cases, reported, this being attributed to the seed being old and to untimely rains the good results were:—

At Venkatapuram, $\frac{1}{4}$ lb. seed produced $25\frac{1}{4}$ lb. grain = 2,520 lb. per acre.
At Alúr, 1 lb. do. $57\frac{3}{4}$ do. = 5,775 do.

In both cases the area sown was ·01 acre, and the soil red and manured.

In the Godávari, there was failure similar to that with the wheat. In South Arcot, the report shows failures or incomplete results. In Tanjore, the seed was said to be bad, and the results of one small experiment which is reported are vitiated by the use of local measures. From Madura, the tahsildar's reports show many failures, and only one can be picked out as satisfactory, in which experiments, at Vada Madura, on ·05 acre of manured land, the outturn was 75 lb. or 1,500 lb. per acre. On the Madura farm the outturn for four plots totalling an acre in extent was 1,656 lb. of grain. From Salem, the reports are generally unsatisfactory, except from Krishnagiri, where the ryots are said to desire a larger supply of the seed as the cobs obtained were large. The Nílgiri experiments are reported as total failures, whilst the Curator of the Government Gardens states that the crop raised by him was cut when in flower for fodder.

Mr. Venkata Chariyar, of Kadatúr, Salem, reports that maize did fairly and was much liked by the ryots of his neighbourhood; and Mr. Kristnasami Mudaliar, of Shiyáli, states that he raised $\frac{1}{4}$ acre of the crop which produced 225 lb. of grain.

80. *Sorghum.*—Several sorts were sent out. The reports from Madura, Godávari, Nílgiris, South Arcot and Bellary chronicle failures, as also does Mr. Franklin of Tirupatúr. From Kurnool, amidst general failure, one experiment is recorded as having given an outturn of 1,000 lb. of grain and 2,000 lb. of straw per acre. Mr. Venkata Chariyar sowed three sorts, but none of them throve owing to a want of rain and he used the crops for fodder. The Rev. D. A. Rees, of Hassan, Mysore, sowed 2 lb. of seed on $\frac{1}{2}$ acre of gravelly soil which had been manured, and obtained about 3,500 lb. of green fodder in 2 to 4 months, cutting it as required for his cows.

81. *Madagascar Paddy.*—In Bellary, out of 13 lb. seed sent only 5 lb. were sown, and the crop was standing at date of report. In Chingleput, the results were failures.

82. *Carolina Paddy.*—On the Madura Farm and in Kurnool, the crops failed. The Rev. A. Pierse, of Salem, reports that, though only part of the seed sown germinated, the crop was a very promising one and the ears were very large and long when it was destroyed by cattle.

83. *New Orleans Cotton.*—The seed sent to Vizagapatam, Tanjore, and Anantapur was not sown. In Madura, the crops failed, as did nearly all of those sown in Bellary, Chingleput, and South Arcot, whilst from Kurnool, the report does not clearly show what the result was. The Rev. A. Pierre remarks regarding this crop—"very superior! Cotton is soft and silky, and the crop very abundant." Mr. Fransen, Cochin, in reporting a small experiment displays close observation, and says the yield was satisfactory, though the crop was sown too late.

84. *Nankin Cotton.*—The reports regarding this crop are very similar to those as to the New Orleans cotton and are not worth specifying.

85. *Tobacco.*—The reports from the Godávari and Vizagapatam show that the seeds were not utilised, having probably been received too late. In Tanjore, nothing was done. In Chingleput of two lots sent out, one was sown and resulted generally in failures; the other was not utilised. In South Arcot, the results were generally

figures, but a few incomplete results are recorded. In Bellary, it is so reported that the seeds either failed to germinate or that the plants withered subsequently. In Kurnool, only one experiment is worth notice, and that is where 3 *lb. of grain* are said to have been obtained from ·01 acre of land!! On the Madura farm, several experiments were made with exotic tobaccos which were partial failures.

On the Nílgiris, the experiments in Ootacamund were unsuccessful; but Mr. Jennings at Dodabetta found the seed to germinate freely and had plants picked out on 300 square feet of land. Although taken no special care of during their growth, except for an occasional watering and the removal of insects, the plants grew well, and the leaves were very fine and delicate, though not large. Mr. Jennings has no doubt that tobacco can be grown in some places on the hills, and that the flavor should be delicate. Colonel Scott, at Variday Mallai estate, raised seed from Havannah tobacco, and at the time of reporting had 20,000 seedlings raised therefrom. Of some later experiments it was too soon to speak, but Mr. J. Ryan remarks that the crop "promises to be a pronounced success."

Some experiments made by the Rev. A. Pierre resulted in complete failures, whilst Mr. C. Kristnasami Mudaliar, of Shiyáli, remarks regarding some seed sent to him that the locality is not well suited for the growth of the crop, and that, as he has no one of experience in the management of the crop on the spot, it is not of much use trying experiments there. Gulam Mahomed Khan Bahadur, who has a farm in the Chingleput district, reports that he planted ¼ acre with the crop and describes his management, which shows that the crop was reared carefully. The produce was cured according to the native method and was at the rate of 1,375 lb. of leaf per acre. He proposes to carry on further curing experiments in the future.

86. *Indigo.*—The seed distributed was raised at Saidápet farm from seed obtained from Cawnpore, but the only results reported are from Chingleput, where the crops failed; from South Arcot, where the results are incomplete; and from Mr. C. Kristnasami Mudaliar, who made two unsuccessful trials, the failures being due in one case to continuous rain after sowing, and in the other to the absence of rain.

87. *South American Castor beans.*—A few seeds (three) were sent to the Collector of Kistna, and he carefully collected the beans from two plants that he reared, which are still flourishing. These beans have been distributed for further propagation on the lankas of the Kistna, and the produce is to be preserved for seed, if the plant does well.

88. *Melons.*—Some seed of both water and musk melons was imported, but the results of experiments are generally unpromising. In South Arcot, the trials resulted chiefly in failures, except one experiment which promises better. In Madura, entire failures are reported. In South Canara, several experiments were made, but none were very successful; the water melons are well spoken of as being better flavored than usual, and the musk melons are also described as good; the seed was probably sown too late in the season.

Both the Rev. A. Pierre and Mr. C. Kristnasami Mudaliar report favorably of young plants, which were still growing when they wrote.

89. *Brinjals* of exotic varieties were tried in South Arcot and failed. Mr. C. Kristnasami Mudaliar reports raising a few plants which bare very large fruit of good flavor, and the Rev. A. Pierre speaks rapturously of his success with this plant, but gives no particulars.

90. *Manilla hemp.*—Numerous reports regarding the plants raised from shoots distributed during the past few years have been received. At Palamcottah, the plants seem scarcely to do more than exist, and on the Madura farm the plants are poor and weak.* At Tanjore, some plants have grown fairly, but as none have yet fruited no experiments in extracting fibre have been made. At Coimbatore in the municipal garden, the plants have apparently grown well, and are being propagated; a 2½″ rope 35 feet long has been made from the fibre extracted and is said to weigh only 2½ lb. In the Salem taluk, the plants appear to have been successfully grown, but no particulars are given; and the Sub-Collector speaks well of the hardiness of the plant, and of its growth under adverse circumstances at Hosúr. The South Arcot report contains no remarks to show the condition of the plants raised there, and from

* They have since died out.

Vizagapatam it is reported that the plants are thriving and have fruited, but that no experiments in extracting fibre have been made for want of machinery. The Deputy Collector, Adóni, has forwarded a fair sample of fibre made under his orders, but no particulars as to cost were furnished.

Mr. Brito, of Mangalore, speaks well of the growth and vigor of the plant when raised without manure, and Mr. C. Kristnasami Mudaliar, of Shiyáli, says that it grows there easily and freely. Mr. Vencata Chariar, of Salem, was not successful in raising good plants, but attributes the failure to a bad sub-soil. Several other private experimenters report more or less favorably of the growth of the plant, but there is nothing to record regarding the extraction of fibre from it. The uselessness of the fruit for food is generally commented on.

91. *Edible cactus.*—The leaves of this cactus received from Cyprus in March 1885 were distributed as soon as possible after receipt. The results are reported as follows. In Bellary, all died in spite of great care. In Anantapur, all died a short time after planting. Mr. Gostick, of Karúr, was unsuccessful in raising any plants in spite of great care. Mr. Price also failed to raise any plants. Dr. Shortt, on the Shevaroys, has raised fine plants which are healthy and making fresh shoots, but their growth is very slow. Colonel McLeod, at the Gun Carriage Factory, has two plants growing, as also has the Agri-Horticultural Society. The Government Botanist states that the leaves reached him at Ooty in good condition, grew readily, and have increased in number, and he is planting some out in the open there and at Kalhatti.

92. *Divi-divi.*—Colonel Scott, of the Varideymalai estate, North Coimbatore, reports that the plants he has have made little growth and that the altitude (3,600 feet) appears too great for them; he adds that the *Cæsalpinia Sappan* does fairly well. On the Madura farm, it is reported that there are 212 healthy plants with an average spread of 8 feet, some of which are 9 feet high. Mr. C. Kristnasami Mudaliar finds the plant to grow easily with little care, and Mr. Brito says the trees grow well at Mangalore, and though they are only three years old, he has already collected a considerable amount of pods from them and that the prospect is favorable.

93. *Eucalypts.*—The reports show that the seeds sown in South Canara, the Godávari, Coimbatore and Kistna failed. At the Agri-Horticultural Society's Gardens, Madras, some young plants of the *E. Microcorys* are reported as doing well. In Cuddapah, some plants of the *E. Planchoniana* are growing at Horsleykonda and are to be planted out. In Nellore, *E. Planchoniana* germinated well, but nearly all damped off whilst still young; whilst the *E. Microcorys* did not germinate. In North Arcot at Palmanér the seedlings, varieties unspecified, are said to be healthy and ready to be planted out. In Tinnevelly, the only species that germinated is the *E. Baileyana* and the growth of that has been small at an elevation of 3,000 feet. Dr. Shortt states that a few seeds only germinated, but that the plants are growing fairly well. In Vizagapatam, at Koraput, it is simply reported that some failed and some have succeeded. Mr. C. Kristnasami Mudaliar has some plants 30 feet high, the growth of two years from seedlings and has raised some more plants from seed and finds that they grow easily with but little trouble. The Government Botanist states that the *E. Planchoniana* is growing well at Coonoor.

94. Taking all the reports of the experiments made with seeds sent out by the department together, I cannot but remark that the results are not worth the labor and expense incurred to obtain them. In very few cases have the officers by whom the experiments are conducted, the aptitude, knowledge, or time required to secure good results, and it will be far better to restrict operations in this direction to the cases where these desiderata can be secured or where the department can itself lend direct assistance. In every possible case of course where private experimenters will assist us, the department should supply seeds for experiment, but these cases are as yet few.

95. Besides the seed wheat and barley referred to above, which were sent out early in the year, the following quantities were obtained for distribution in the Nílgiri district towards the latter end of the year:—

English seed wheat from Messrs. Oakshott, 100 bushels.
Do. barley from Messrs. Carter, 80 bushels.
Punjab seed wheat, 100 bushels.
Do. barley, 22 maunds.

The English seed wheat turned out on arrival to have lost its vitality, except one lot of 25 bushels which was nearly all sent to the Nílgiris. The Punjab wheat was also a good deal damaged when opened out, but by cleaning it the following quantities of good seed were obtained :—

White wheat, 63 bushels. | Red wheat, 67⅛ bushels.*

My inquiries on the Nílgiris, however, led me to conclude that there is but little chance of wheat becoming an important crop there, and I am convinced that the idea of trying to introduce high class English wheats is a mistake. These wheats have for many years been accustomed to growth under a system of high cultivation and with great care. They are generally crops of nine or ten months' growth and would take some years to alter their habit under the different conditions met with on the Nílgiris. There also the system of tillage is very inferior, the supplies of manure are scanty and the soil is almost entirely wanting in lime, which is so much required to produce a good sample of wheat. Besides this there is evidence to show that even the ordinary *spelt* wheat now grown on the hills only makes a dark-colored bread, whilst the same sort of wheat grown in Coimbatore when made into bread gives a good white loaf.

VI.—Miscellaneous.

Collection of Native implements.

96. The formation of a collection of native implements and tools, referred to in paragraph 118 of the last report, has been stopped and what articles had already been collected to a great extent used for other purposes. Representative collections from the Tinnevelly, North Arcot, Bellary and Vizagapatam districts were obtained; but a demand for a collection for the Indian and Colonial Exhibition in London this year led to the greater number of the specimens collected being sent away again, and it was decided that no further steps need be taken by the department to complete the collection, and that what remained of it might be handed over to the Agricultural College. It appears to me to be highly desirable that we should maintain at or near Madras for the information of the public a museum containing typical specimens of the implements and tools used in different parts of the presidency in the processes of agriculture and the trades and industries closely connected therewith. The Agricultural College appears to be the place specially adapted for the formation of such a collection and also where it would be most useful. The distance of Saidápet from Madras would be immaterial to any one really interested in the study of Indian agriculture, and the institution itself would be greatly benefited by the possession of a good museum of native agricultural implements.

Collection for the London Exhibition.

97. The collection of implements and tools for the London Exhibition alluded to above consisted of specimens of small tools, &c., sent in original, and models of all large implements, ploughs, water-lifts, &c. The collection as sent fairly represented the implements, &c., used in the presidency; but, after it had been nearly completed and was almost ready for exhibition, orders were received from the Government of India to send the specimens to Calcutta to be there combined into one general collection for the whole of India. What subsequently became of the collection is not known. It was sent to Calcutta.

Library.

98. There is no regular library attached to the Agricultural Department, but access is possible to the books in the Agricultural College Library at Saidápet in case of necessity. This is not a very convenient arrangement as the distance and time taken in sending for, or in going to Saidápet to look up books of reference must be considerable. The following papers were supplied to the office during the past year and during the part of it the papers received in the Agricultural College were also sent for perusal :—

(1) Planters' Journal.
(2) Queenslander.
(3) Journal de L'Agriculture.

It is hoped that during the current year a larger supply will be made to this office as none of the Agricultural College papers are now sent for perusal.

* This subsequently proved to be bad seed.

Agricultural sheets.

99. The preparation of sheets for the District Gazettes was brought to a stand still during the year, as the question of their translation was not settled. This has now been decided and the publication should proceed regularly in future.

Publications.

100. No new publications were issued during the year. The Saidápet farm records, completed in the previous year, were issued; copies of the book being widely distributed gratis throughout the presidency to officials; not many copies remained for the general public.

101. *Establishment.*—The office of Deputy Superintendent of Government Farm was abolished on 1st September last, and Mr. S. L. D'Silva reverted to his permanent appointment as local cattle disease inspector. He, however, remained in charge of the Saidápet farm and stock throughout the year and gave thorough satisfaction in the performance of his duties. The manner in which he carried out my instructions in preparing the collection of agricultural implements and machines for the London Exhibition is also deserving of notice. The overseer of the Saidápet farm was transferred in August to the Madura farm, where his salary is paid by Government. The storekeeper attached to the Saidápet farm was brought on the strength of the establishment for agricultural services from 1st September in a similar post. The farm clerk was retired on the abolition of the farm and has been recommended for a gratuity.

My office establishment now consisting of an accountant and a circuit clerk. The former was granted three months' privilege leave on medical certificate by the Director from 10th November, and the latter having fallen sick just before with fever, contracted in Kurnool, was absent on leave on medical certificate till the end of the year. The consequence was that my office was nearly at a standstill for a time, and the routine of it thoroughly disorganised and the more so as I was travelling during nearly the whole period. The establishment had not been adequate to the work before, and the transfer of my head-quarters to Chepauk had not resulted in the amalgamation of my office with that of the Director.

The service books of all of the above officers who remain under my orders have been duly posted up.

102. The following is the usual summary of charges on account of agricultural services for the past five years. Details will be found in Appendix V. The great reduction in expenditure on purely agricultural work will be noticed :—

Items.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.
Receipts—	RS.	RS.	RS.	RS.	RS.
Provincial grant	20,000	..	2,000	2,000	2,000
Surplus Pound Fund	46,832	29,086	34,254	32,318	† 42,311
Departmental receipts	4,992	6,049	11,209	3,950	3,012
Total ..	71,824	35,135	47,463	38,268	47,323
Expenditure—					
General Supervision	21,468	23,285	25,219	15,374	13,939
Saidápet Experimental farm	10,198	10,830	14,767	7,483	4,918
School of Agriculture	20,325	24,843	23,851	* ..	..
Estate charges and improvements	2,811	2,487	2,035	1,283	77
District operations	..	7,190	3,249	2,644	5,501
Cattle Disease inspection	..	8,809	23,103	28,008	33,623
Total ..	54,802	77,444	92,224	54,792	58,058

* Transferred to the Educational Department. † Approximate only.

July 1886.

(Signed) C. BENSON, M.R.A.C.,
Assistant Director of Agriculture.

P.S.—Since the above report was completed, the following further information regarding district crop experiments have been received. From the Godávari, a further series of failures with maize, tobacco and cotton is reported, the cause being variously attributed to bad seed, dry weather and in one case to too great fertility of the soil (!!) for maize. The Collector of North Arcot forwards a large number of reports of failures and promises some more that have been called for; two reports of crops of maize raised in Wandiwash taluk are submitted, but the return in one case was not noted and in

the other poor; one crop of Planters' Friend is reported to have done well in the same taluk and yielded a fair outturn; 3,500 lb. of sunflower seed are reported to have been received from 239 seeds in the Kangundi division of the district, and seed retained for further experiment; it appears doubtful if this can possibly be a correct report. Carolina paddy in the same district on ·17 acre of land produced $17\frac{1}{2}$ mercals of grain; there is nothing to show what the mercal may be locally; but it is remarked that the seed adheres strongly to the straw. Of tobacco, the only two reports of any success show that the crops were damaged by heavy rain, and only a few plants grew well and that they were reserved for seed. Some other experiments are spoken of as having succeeded, but the reports have not been forwarded as yet.

The Collector of Tanjore states that no trial was made by the Deputy Collector with the tobacco seeds supplied to him last year as they arrived too late, but that they will be sown this year.

The Collector of Bellary forwards further reports regarding growth of Manilla hemp at Désam in the Bellary taluk where the growth appears to have been good. Some fibre was extracted in various ways, but as I have not seen the samples, I am unable to form an opinion on them. No note of the cost of extracting the fibre was furnished. From Anantapur, it is reported that the Manilla hemp shoots sent out died. From Malabar the following notes are furnished:—

"Of the twelve plants sent to the Wynaad range, six are alive and in good condition, the rest having been destroyed by wild pigs. Of the six plants, one has fruited, two are 12 feet high and four average 6 feet. All are growing vigorously, and the climate of Wynaad evidently suits them.

"Of the nine plants sent to Palghát, only six are living, the remaining having been destroyed by wild elephants in the Naikin shola section of the Chenat Nair forests, where they were all planted in May 1884. The living plants have attained the average height of 5 feet and are looking healthy and in good excellent condition. The six plants eaten by elephants averaged 15 feet in height. The growth of Manilla hemp in the Chenat Nair Forest was superior to that in Wynaad."

In Malabar also the experiments with eucalypt seeds were unsuccessful except as regards the *E. Siderophloia* and *E. Globulus* sown at Manantoddy. The former variety appears to be doing fairly, but the latter is reported as looking very poor. The District Forest-officer expresses a wish that he may be furnished with more Queensland eucalypt seeds to sow at Manantoddy, as some other older trees appear to be doing well there.

Regarding all the experiments alluded to above, I cannot do better than quote the following remarks of the Collector of Malabar as being applicable to them, and to most of another district crop experiments. He says: "I fear the truth is that all the officials are too busy to devote proper attention to the subject."

(Signed) C. BENSON, M.R.A.C.,
Acting Director of Agriculture.

20th August 1886.

APPENDIX I-A.

SKETCH FOR AGRICULTURAL SURVEY.

Major Headings.	Minor Headings.
Aspect and Physcial Geography	Geology and effect on soils, &c.
	Hills, plains, rivers.
	Drainage systems.
	Woods and forests, distribution, denudation in recent times, protection and reboisment.
	Supply of fuel, building, and other timber.
	Villages— Size, proximity, condition.
	Houses— Style, condition.
Population and Health	Agricultural population, distribution, classes.
	Population dependent on above.
	Sickness and mortality, loss of labor from.
Land tenures and holdings	Arable, cultivated, occupied areas.
	Holdings, nature and size of—.
	Resident and non-resident occupiers. Condition of holders.
	Value of holdings—Assessment.
	Waste lands, uses and capabilities of—.
	Land Improvements, extent and possibility of—.
	Collection of land revenue.

Major Headings.	Minor Headings.
Capital and labor	Value of land.
	Value of ryot's farming stock.
	Indebtedness.
	Incomings and outgoings of ryot.
	Rates of interest.
	Laborers.
	Supply—demand.
	Wages.
	Condition.
Markets and Communications	Value of produce on field and at export towns.
	Markets—proximity to, accessibility of—
	Facilities for transport.
Seasons and Climate	Rainfall.
	Distribution and nature of, amount required, &c., failure of, effect on crops.
	Temperature.
	Humidity.
Water-supply and Irrigation	Supply for people and stock.
	Irrigation works—
	Channels, tanks, wells, areas under—
	Supply under—
	Subterranean-water—
	Facilities for well-sinking.
	Cost of irrigation.
	Effect of do. on crops and soils.
Soils, Tillages and Cropping	Nature and distribution of soils.
	Systems of tillage.
	Cropping of different soils—
	Irrigated and unirrigated.
	Rotation—fallows.
	Manures and manuring, nature, supply, application.
	Sowing—
	Methods and seasons for—
	Harvesting—
	Methods and seasons for—
	Special and industrial crops.
	Food-grains, cereals and pulses.
	Insect attacks and other plagues.
Live-stock	Cattle—sheep
	Breeds—breeding—management.
	Diseases, epidemics, mortality.
	Pasturage and other fodders.
	Working cattle—
	Value of stock.
	Protection during drought.
	Storage of fodder.
Dead-stock	Implements, machines and tools of the farm.
	Repairs and construction.
	Carts.
	Machines for preparing produce for the market.
Descriptive maps and diagrams	Distribution of soils.
	Do. population.
	Do. stock.
	Do. crops.
	Do. and nature of rainfall.
	Irrigation systems and drainage areas.
	Communications—internal and external.

APPENDIX I.-B.

Agriculture, its Conditions, Usages, Customs, Practices and Requirements.

Seasons	General characters of
	Distribution of rainfall.
	Characters desired in.
	Do. injurious in.
	Winds and storms.

Major Headings.	Minor Headings.
Soils	Local and general names for— Distribution of— Characters of— Effect of Geological formation on—
Water-supply	I. For men, animals and Irrigation (generally) II. Subterranean supply— 1. Distribution of wells. 2. Construction of wells. 3. Facilities for sinking wells. 4. Persistency of supply in wells. 5. Capacity of wells. 6. Cost of irrigating from wells. III. Effect of Irrigation, (*a*) on soils, (*b*) on crops— 1. Under Irrigation works. 2. Do. wells.
Tillage	Systems of— Effect and efficiency of— Implements used in—Their names and uses.
Cropping	Systems pursued for different seasons.—Soils and conditions. Rotations. Mixed cropping. Fallows.
Manures	1. Substances used as— 2. Management, accumulation and storage of 3. Time and amounts applied. 4. Crops to which specially applied. 5. Amounts obtained from, (*a*) cattle, (*b*) sheep. 6. Money-value of— 7. Substances available as but not utilised.
Crops	(*a*) Food-grains, cereals and pulses. 1. Varieties, quantities.—Characters of— 2. Diseases of, and insects attacks on— 3. Methods and seasons for sowing or planting. 4. Amounts of seed used. 5. Customary mixtures of seed. 6. Treatment during growth. 7. Methods and seasons for harvesting. 8. Threshing, cleaning and disposal of produce. (*b*) Special and industrial crops— Cotton, indigo, oil-seeds, fibres, sugar-cane, tobacco, &c. (similar particulars to those for food-grains). (*c*) Minor crops— Condiments and spices. Vegetables. Topes and Orchards (particulars as above).
Live-stock	(*a*) Cattle, (*b*) sheep and goats. 1. Breeds, breeding and management. 2. Housing, feeding and condition of— 3. Diseases of— Names, symptoms, losses from 4. Pasturage and other fodder for Storage of fodder. Grazing-grounds. 5. Artificial foods used for— 6. Numbers and value of— 7. Protection during droughts.

Major Headings.	Minor Headings.
Dead-stock	Implements, machines and tools of the farm and allied industries. Names.—Numbers kept.—Description.—Uses. Materials for construction. Cost of construction and repairs.
Waste Lands	Distribution of— Capabilities and requirements of—
Land Improvements	What are customary. Feasibility of others.

APPENDIX II.

Regulations for Plough Trials.

I. Points to be tested in ploughs--

1. *Quality and quantity of work.*—The depth and width of furrow, degree of pulverization and style of the whole work to be considered.
2. *Adjustability.*—Under this head will be considered the manner and facility of making all necessary adjustments.
3. *Durability.*—The kind and quality of material, liability to wear or break, or in any way be disabled, to be noted.
4. *Simplicity.*—The simplicity of construction and mode of operation will be examined under this head.
5. *Draft.**—The draft will, if possible, be measured by the dynamometer in the following manner :—

Rules for the Dynamometer Test.

This test will be made on even, uniform ground, and each plough will have one furrow to prepare the ground, and then two trial furrows in which the draft will be marked at six points, as follows :—

1. Three parallel lines will be drawn on the land 50 feet apart, and at right angles to the furrow.
2. Three *Callers* will stand at these lines and, as the plough crosses each, they will call *one*, *two* and *three*, for the first, second and third line crossed.
3. As each of these numbers is called, the reader of the dynamometer will call the draft.
4. Two time-keepers will note the time between the call of *one* and *three*, which will give the time for the 100 feet of furrow turned during the tests.
5. A measurer with instruments made for the purpose, and which secure absolute accuracy, will measure and call the depth and width of the furrow where the lines above named cross it.

II. The depth of the furrow shall be not less—

(*a*). For ordinary work, than 4 inches.
(*b*). For deep work, than 8 inches.

III. The test points will be rated as follows, 100 showing perfection in all :—

	Scale A.		Scale B.
1. Quality	30	or	35
2. Adjustability	10	or	15
3. Durability	15	or	20
4. Simplicity and cheapness	25	or	30
5. Draft	20		...
Total ...	100		100

IV. When a plough is entered, it will be numbered, and have the number attached to it in plain characters. Every plough thus entered will be called and known by its number throughout the trial.

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* Note.—Scale B is only intended to be used when it is impossible to test the draft.

V. Ploughs may be entered in the following classes, according to the work they are intended for :—

1. Ploughs for ordinary work on unirrigated land.
2. Ploughs for deep work on unirrigated land.
3. Ploughs for irrigated land.
4. Ploughs for breaking up and reclaiming waste land.

Ploughs not in any class will be tested and the results given in an appendix to the tabulated results.

VI. The representatives of the ploughs will manage their own ploughs, without interruption from other parties ; and each shall have his land and the judges entirely to himself while ploughing, and may make such representations of the qualities of his plough and its work, as he may think proper.

The representatives of the various ploughs will not be allowed to criticise any ploughs other than their own.

It is best for each manufacturer to send some one to manage his ploughs ; but, if any plough is entrusted to the committee of arrangements, it will have a fair trial and be managed by skilful hands.

VII. The ground to be ploughed shall be as uniform as possible in quality and be staked off into plots of ⅛ of an acre.

The representatives will draw lots for the order in which they will be called ; and when called, will take the plots in order, beginning at the end of the field.

VIII. Not less than three persons shall be appointed as judges ; one of these should be an engineer and the others, if possible, practical agriculturists.

The Committee will not appoint any one a judge who has any interest in the manufacture or sale of any plough on trial.

IX. When a plough is called, each judge will receive a card, on which will be shown the number of the plough and the points to be tested ; and each judge will record his judgment against each point. And when the next plough is called, he will give his card to the Secretary of the committee and receive another with the number of the plough called.

From these cards the committee will make up and tabulate the decisions of all the judges on all the tests of all the ploughs.

The decisions of the judges are final.

X. The committee of arrangements will have control of the field and ploughs at all times during, and in all matters concerning, the trials.

APPENDIX III-A.

STATEMENT showing the number of stock maintained during each month of the year 1885-86.

Description of Stock.	1885.									1886.			
	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Average.
Bullock and bulls	14	14	14	9	9	9	7	7	7	7	7	7	9·3
Cows	8	8	8	7	6	5	5	5	5	5	5	5	6·0
Young bulls and heifers ..	23	23	23	23	21	21	20	20	20	20	20	20	21·2
Small calves	8	8	9	9	8	8	11	12	12	11	11	11	9·8
Sheep	99	99	98	99	95	84	82	81	82	119	118	118	97·8
Lambs	39	39	39	39	39	40	41	46	53	21	43	43	40·2
* Equivalent as country cattle of 300 lb. live weight	94·7	94·7	95·0	83·2	77·9	73·8	70·0	70·8	71·7	75·4	77·4	77·4	80·2

* 1 Cow, bull, bullock = 2 young bulls or heifers = 4 small calves = 10 sheep = 20 lambs = 2 country cattle.

APPENDIX III-B.

Cost of artificial food supplied to the live-stock during the year 1885-86.

—	Working cattle and bulls.		Young-stock.		Cows and calves.		Sheep.			
	Amount.	Value.	Amount.	Value.	Amount.	Value.	Amount.	Value.	Amount.	Value.
		RS. A. P.		RS. A. P.		RS. A. P.		RS. A. P.		RS. A. P.
Ground-nut cake ..	11,876	190 0 3	12,090	193 7 0	9,686½	154 15 9	20,059	320 15 1	53,711½	859 6 1
Bran	..	..	118	2 15 2	2,466	61 10 9	6	0 2 5	2,590	64 12 4
Salt	312	9 0 7	400	11 1 4	337	9 4 2	506	14 9 6	1,555	43 15 7
Grain	76	2 8 6	127	4 3 9	840	28 0 0	..	..	1,043	34 12 3
Dhall husk	6	0 1 7	6,263	104 6 2	3,318	55 4 10	180	3 0 0	9,767	162 12 7
Total ..	..	201 10 11	..	316 1 5	..	309 3 6	..	338 11 0	..	1,165 10 10
Deduct one-third charged to manure	..	67 3 8	..	105 5 10	..	103 1 2	..	112 14 4	..	388 9 0
Net charge ..	..	134 7 3	..	210 11 7	..	206 2 4	..	225 12 8	..	777 1 10
Cost per head per mensem	..	1 3 3	..	0 13 3	..	2 13 10	..	0 2 2	..	*0 12 11

* On total stock calculated as country cattle.

APPENDIX IV.

Statement showing the weekly rainfall in 1885-86 compared with the average of the previous fifteen years.

Weeks.	1885-86.		Average of the previous fifteen years.		Weeks.	1885-86.		Average of the previous fifteen years.	
	Rainfall.	Wet days.	Rainfall.	Wet days.		Rainfall.	Wet days.	Rainfall.	Wet days.
1st Week	..	..	·14	·13	27th Week ..	·89	3	2·23	2·47
2nd ,, ...	..	..	·08	·12	28th ,, ...	1·73	3	1·87	2·06
3rd ,, ...	..	..	·15	·19	29th ,, ...	..	..	3·18	3·40
4th ,, ...	..	..	..	..	30th ,, ...	·27	2	3·54	3·26
5th ,, ...	..	..	·95	·37	31st ,, ...	6·66	6	2·45	2·40
6th ,, ...	·03	1	·91	·26	32nd ,, ...	·57	1	4·69	3·20
7th ,, ...	..	..	·16	·20	33rd ,, ...	11·27	4	3·64	3·34
8th ,, ...	·02	2	1·82	·67	34th ,, ...	6·65	2	4·00	2·93
9th ,, ...	..	..	·13	·40	35th ,, ...	..	..	3·47	2·51
10th ,, ...	·05	2	·56	1·00	36th ,, ...	3·08	3	1·15	1·73
11th ,, ...	·75	4	·91	1·39	37th ,, ...	..	..	1·36	1·34
12th ,, ...	1·89	3	·27	1·34	38th ,, ...	2·50	3	1·33	1·20
13th ,, ...	..	..	·48	1·66	39th ,, ...	..	..	·51	·93
14th ,, ...	..	..	·74	1·60	40th ,, ...	..	..	·30	·48
15th ,, ...	..	..	·90	2·13	41st ,, ...	·80	2	·12	·20
16th ,, ...	·42	2	·95	1·74	42nd ,, ...	..	..	·05	·27
17th ,, ...	·13	2	·76	2·19	43rd ,, ...	..	..	·23	·34
18th ,, ...	·05	1	1·08	2·67	44th ,, ...	..	..	·13	·20
19th ,, ...	·61	3	1·17	2·67	45th ,, ...	..	..	·47	·34
20th ,, ...	·54	4	1·30	2·21	46th ,, ...	..	..	..	..
21st ,, ...	1·33	2	·79	1·93	47th ,, ...	..	..	·20	·65
22nd ,, ...	·90	4	1·25	2·33	48th ,, ...	..	..	·09	·13
23rd ,, ...	..	..	1·55	2·14	49th ,, ...	..	..	·05	·20
24th ,, ...	1·48	2	1·25	2·00	50th ,, ...	·35	1	..	..
25th ,, ...	4·03	4	1·49	1·67	51st ,, ...	·14	1	·14	·26
26th ,, ...	·35	1	1·62	1·39	52nd ,, ...	..	..	·04	·07

APPENDIX V.

STATEMENT of account for Agricultural Services during 1885-86.

	RS.	A.	P.	RS.	A.	P.
I. General supervision—						
Establishment	11,167	7	2			
Travelling charges	1,793	8	5			
Stationery	32	1	0			
Contingencies	406	0	6			
				13,399	1	1
II. Saidápet Experimental farm (see report, paragraph 68)				4,917	14	6
III. Estate charges and improvements—						
Repairs to farm buildings	1	4	4			
Sundry repairs and improvements ...	14	13	0			
Extension and repair of water channels.	61	3	5			
				77	4	9
IV. District operations—						
Exhibition of improved ploughs and machines	100	0	3			
Improvement of Agriculture and trade.	2,442	6	11			
Distributing seeds	1,256	4	7			
Ploughing matches	257	1	0			
Models for London Exhibition ...	572	6	7			
Madura Farm Superintendent's salary.	360	10	0			
				4,988	13	4
Total				23,383	1	8
V. Cattle-disease inspection	33,623	4	8			
Government stallion charges	691	13	2			
				34,315	1	10
Grand Total				57,698	3	6

Income—	RS.	A.	P.
Saidápet Experimental farm (see report, paragraph 68).	2,906	13	1
Government stallion service fees	104	12	0
Surplus Pound Fund	*42,311	0	0
Grant for improvement of agriculture and trade ...	2,000	0	0
	47,322	9	1
Cattle-disease inspection	610	14	2
Grand Total ...	47,933	7	3

* Approximate only.

ENCLOSURE No. 2.

From J. MILLS, Esq., M.R.C.V.S., V.S., 1st Class, A.V.D., Inspector of Cattle Diseases, Madras Presidency, to the Director of Revenue Settlement and Agriculture, St. Thomas' Mount, 18th June 1886, No. 1507-B.

I have the honor to forward the annual report of this department for the year 1885-86.

2. The map I have traced on the Cyclostyle and can supply fifty copies to accompany the report when printed.

Enclosure.

Cattle Inspection.

The four probationers admitted into the department during the last official year have been promoted to the grade of Local Cattle Disease Inspector. During this year four more were admitted, out of which one resigned. The strength of the department on the 31st of March 1886 was as follows:—

Inspector	1
Deputy Inspector	1
Local Inspectors	17
Probationers	3
Total ...	22

2. During the recess at the Agricultural College I visited the following districts:—

Arcot, North, Arcot, South, Chingleput, Coimbatore, Madura, Nílgiris, Salem, Tanjore, Tinnevelly and Trichinopoly, a report of which will be found in this office letter, No. 1895 B., dated 30th October 1885.

3. *Deputy Inspector.*—The Deputy Inspector, Mr. Shunker, returned to duty from his leave on the 26th of May 1885. During the year he visited the districts of Arcot, South, Chingleput, Kistna, Kurnool, Malabar, Nílgiris, Salem and Tanjore. During the period he was on leave, Local Cattle Disease Inspector M. Venkataramana Sastry, who acted for him, inspected in the following districts:—

Arcot, North, Arcot, South, Canara, South, Coimbatore, Tanjore, Tinnevelly and Trichinopoly.

4. *Local Inspectors.*—The Local Inspectors are posted as follows:—

1.	P. Raghava Pillay	Trichinopoly.
2.	T. Ramanjulu Naidu	Nellore.
3.	M. Narayan Rao *	South Canara.
4.	M. V. Ramachandra Iyer	Tanjore.
5.	M. Swernalinga Naicker	Vizagapatam.
6.	M. Bhavani Shunker Rao	Kurnool.
7.	S. L. D'Silva †	Nílgiris.
8.	M. Venkataramana Sastry	Coimbatore.
9.	K. Pudmanabhaya	Bellary
10.	A. Canthaya Moodelliar	Chingleput.
11.	M. Kuppusami Sastry	Arcot, North.
12.	B. K. Santaya ‡	Salem.
13.	K. Sethu Rao	Arcot, South.
14.	V. P. Subramani Moodelliar	Tinnevelly.
15.	R. Narayan Rao	Madura.
16.	K. Ramen Menon	Malabar.
17.	C. Viswanath Iyer	Anantapur.

5. The work of the Local Inspectors has, with few exceptions, given me satisfaction. I regret to have to record the death, from pneumonia, of Local Cattle Disease Inspector B. Ramiah Reddy of Vizagapatam, which took place on the 10th November 1885. Local Cattle Disease Inspector M. Swernalinga Naicker has succeeded him.

6. *Probationers.*—The probationers have done very well so far, and I am sure they will turn out good inspectors. There is a great difficulty in obtaining candidates possessing the necessary qualifications for the work; in fact, the present vacancies remain unfilled, but some men will be available from the class which completes its course at the Agricultural College at the close of June next.

For number of inspections made and districts visited see appendix No. 1.

7. The service registers of all the subordinates of the department are posted up to date.

Hospital.

8. The admissions to the hospital during the year amounted to 339 against 175 in the previous year. The percentage of deaths on admissions was 12·48, or 3·34 higher than in the last year. This higher rate of mortality is entirely due to the large number (75) of admissions of cases of braxy, a very fatal disease, out of which 27 died, or 64·28 per cent. of the total number of deaths registered in the books of the hospital during the year. Otherwise the results have been very satisfactory.

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* Assistant sub. *pro tem.* to Professor of Veterinary Surgery, &c., Agricultural College.
† Acting Deputy Superintendent, Government Farm, Saidápet.
‡ Doing duty South Canara.

For particulars of admissions, &c., see appendix No. 2.

9. *Operations.*—Twenty operations were performed during the year against 13 in last year.

10. *Act No. IV of* 1879.—The number of admissions under this Act were 12, but no cases were serious enough to warrant special notice.

11. *Pharmacy.*—Seven thousand three hundred and eighteen prepared doses of medicine, besides large quantities of drugs were sent out to the districts. From reports received, the medicines, notably the carbolic balls, seem to have found favor with a large number of cattle-owners.

12. *Hospital Buildings.*—The hospital buildings having been found inadequate to accommodate the increase in the number of admissions, and the want of an office and a dissecting room having been urgently felt, a committee was appointed in G.O., dated 10th June 1885, No. 700, whose recommendations are contained in G.O., dated 14th September 1885, No. 1044.

Office.

13. The office work continues to increase; 3,092 letters were despatched against 2,992 in last year, besides the usual returns, &c., and I find my clerical establishment altogether insufficient to meet the growing work.

Financial Statement.

14. The estimated budget grant for the official year 1885-86 was Rs. 36,240-0-0, expenditure Rs. 33,623-4-8, leaving a balance of Rs. 2,616-11-4 saved under different heads.

15. The receipts on account of treatment of cases, &c., have been Rs. 610-14-2, an increase of Rs. 173-10-11 over the preceding year.

For particulars of expenditure, &c., see appendix No. 3.

Educational.

16. During the year I delivered at the Agricultural College 266 lectures.

17. *Assistant.*—My temporary assistant, Local Cattle Disease Inspector M. Narayan Rao, has done exceedingly well, and is developing into a careful and painstaking teacher. He has been of the utmost advantage to the students.

18. *Students.*—The students of the college have given me every satisfaction. They continue to take great interest in practical work. The want of a proper dissecting room has much interfered with their anatomical studies, which want, it is hoped, will be supplied during the current year.

19. *State Students.*—Of the two students from the Native States of Mysore and Travancore, respectively, admitted during last year, the former, who is a passed student of the Agricultural College, has, after completing one year's training, returned to Bangalore; the other is still under tuition. One student has joined, who enjoys a veterinary scholarship from the Maharajah of Vizianagrum.

20. Mr. Appayah, a most intelligent Assistant Surgeon from Coorg, attended the hospital for three months, with a view to acquaint himself with the diseases of animals.

Experiments.

21. *Protective Inoculation for Anthrax.*—Experiments were conducted with a vaccine supplied by Mr. Batchelor, Veterinary Surgeon at Ootacamund, but it proved useless. These experiments formed the subject of a special report—*vide* this office letter, No. 2056 B., of 21st November 1885. The experiments with Pasteur's anthracine were fully reported upon in this office letter, No. 1723-B., of 15th October 1885.

22. *Hydrochlorate of Cocaine.*—Having heard a great deal regarding the advantages of the use of Hydrochlorate of Cocaine in operations on the human eye, I decided, on the first opportunity, to give it a trial. Fortunately, a case of "worm in the eye" (Filaria oculi) was admitted into the Veterinary Hospital on the 2nd of June 1885 The patient was a large waler mare, extremely troublesome and nervous; in fact, it was with the utmost difficulty that anything like a good view of the eye could be obtained. I therefore cast her, when the parasite was clearly seen wriggling about in the aqueous humour. There was slight inflammation, with partial opacity in the lower portion of the cornea, involving nearly one-half of its surface, which was undoubtedly brought about by the case having been allowed to go too far before surgical aid was sought for, as the worm had been noticed in the eye fifteen days before the mare was brought to me.

23. I procured a solution containing one grain of cocaine in twenty-five minims of water, or of a strength of 4 per cent.; the Membrana Nictitans was held back and the solution painted over

the surface of the cornea, conjunctiva and eyelids with a camel's hair-brush. In about ten minutes complete anæsthesia had taken place, with considerable dilatation of the pupil. I then made a small puncture with the point of a Macnamara cataract knife, well guarded with lint at the upper portion of the cornea, through which the Filaria escaped. In a little less than twenty minutes sensation returned to the eye. No inflammation followed the operation, and the case did well from the first. The opacity gradually disappeared and the patient was discharged cured in fourteen days.

24. This new local anæsthetic cannot but prove of the utmost value in veterinary practice, more especially in operations on the eye. It has only one drawback, and that is its high price. Previously, in operations of this kind, I always used to administer chloroform with the best results, but, of course, although I have never had any accidents with chloroform on the horse, still the danger attending its use, compared with the use of cocaine, is great indeed. Therefore, the latter must, for the future, act as a valuable and safe substitute for chloroform, for the production of local anæthesia.

25. *Acacia Arabica.*—A report was received in the month of October 1885, from the district of Tinnevelly, stating that 147 goats had died with symptoms of poisoning by feeding on the leaves and young shoots of the Acacia Arabica (Babool tree), with a specimen twig for identification. Although I placed no reliance on the statement, and no one could place any, for it is a well-known fact that goats feed largely on these plants without any bad results accruing therefrom, yet I felt it incumbent on me to conduct a small experiment, with a view to test whether feeding goats exclusively on the plant is likely to produce any deleterious effects at all. Accordingly two goats were selected for the purpose and were, for a fortnight fed solely on the leaves and tender branches of the acacia plant. The result was as could be expected; neither of the goats showed the slightest symptoms of ill-health, in spite of their having been kept tied up for so long a period, which is much against the natural bent of the goat tribe. I am, therefore, inclined to think that the deaths above referred to must have been caused by overgorging of the stomach after a long period of semi-starvation, which it appears the goats had been subjected to.

26. *Pony-breeding.*—I visited the district of Coimbatore in the month of August 1885, and made a thorough inquiry into the progress of the breeding operations there. My views were then somewhat hopeful, as the number of coverings which had taken place justified me in coming to that conclusion; but I regret to say that the result of these coverings has been anything but satisfactory, only one foal having been dropped out of 34 mares served. For further particulars *vide* this office letter, No. 27 H.B., of 15th September 1885.

27. Mahdi, one of the two stallions which we had in the district, has become affected with Paraplegia (wind-stroke), and in all probability will require to be destroyed.

28. An endeavour was made to obtain Shan stallions, but we failed to procure them on account of the unsettled state of affairs in Upper Burmah.

29. *Cattle-breeding.*—In the month of February 1886 I inspected Mr. Lee-Kirby's stock at Coonoor, with a view to see if any of his cattle were suited for breeding purposes; for particulars *vide* this office letter, No. 1 S.B., dated 10th February 1886.

STATISTICS.

30. These have been compiled from the periodical returns received in this office during the official year, but cannot be regarded as actual or complete figures for the year, inasmuch as they include statistics for some months of the preceding year and do not take account of those for the last few months of the year under review, the latter having yet to be received from some districts. In this connection I have to mention that Godávari sent in no statistics at all, nor were any returns submitted from that district during the past year; but I cannot persuade myself to believe that no outbreaks occurred there for two consecutive years, while disease was rife in the neighbouring districts.

31. The contagious diseases reported as being most prevalent were (1) epizootic aphtha, (2) anthrax and (3) rinderpest. Anthrax was the most fatal of all, showing a mortality of 84·82 per cent. The rate of mortality from rinderpest has been 57·56 per cent., and epizootic aphtha 3·61 per cent. Anthrax was generally prevalent; the districts which suffered most being South Arcot, Chingleput, Kistna, Cuddapah and Malabar. Tanjore and Trichinopoly reported only sixty and four cases of anthrax, respectively; considering the vast number of cattle in these districts, the figures given can hardly be accepted as correct; they are suspiciously small, especially the latter. Madras was quite free from this malady. Rinderpest was most prevalent in Nellore, Kurnool and Chingleput, while in Malabar and Madras no outbreak of that disease occurred. Epizootic aphtha prevailed in all the districts, but the largest outbreak took place in Coimbatore. The only district which reported glanders is Salem. Forty cases of pleuro-pneumonia occurred in Anantapur.

32. On comparing the statistics received in this year with those of the preceding one, it will be observed that the percentage of deaths on attacks has been 23·63 as against 68·73 in last year. This wide difference between the figures for this year and the last are mainly attributable to the enormous loss by drowning which occurred last year in the South Arcot district, and a very large per cent. of the attacks reported during this year being of epizootic aphtha, a disease, which, under careful treatment, as a rule, does not prove fatal. The death-rate from anthrax was much higher than in the preceding year, while mortality from rinderpest and epizootic aphtha was considerably less. The deaths from epizootic aphtha have been just what they ought to be under proper management.

33. The percentages of attacks and deaths on strength have respectively been ·70 and ·16, which cannot be regarded as high, more especially the latter.

For further particulars of outbreaks, &c., see appendices Nos. 4 and 5.

Miscellaneous.

34. *Outbreak of Epizootic Aphtha on Government Farm.*—In the month of January 1886 a large outbreak of epizootic aphtha occurred amongst the cattle of the Saidápet Farm. The contagion appears to have been imported in one or other of the following ways :—

(1) By the cows brought to the farm to be served by the bulls.
(2) By the working cattle which are frequently taken outside the precincts of the farm.
(3) By the cattle and sheep which pass through the farm in going to the Commissariat slaughter-house.
(4) By the paddy-straw which is bought for the farm cattle which may have come from a village where the disease existed.

35. The fact that the disease first made its appearance amongst the cows renders theories Nos. 1 and 2 less tenable than the others, and when we consider that the disease spread with surprising rapidity and affected the whole of the cows, bullocks and calves almost simultaneously, in spite of the most stringent sanitary and suppressive measures, tends to make hypothesis No. 4 the most probable. Then again, amongst the sheep which do not get paddy-straw, there was only one case. It is very satisfactory to have to record that, although the outbreak was a most severe one, one of the worst I have ever seen, yet no deaths occurred.

36. *Braxy at Guinay.*—The sheep in the Guindy Park suffered from a very fatal outbreak of braxy (a form of anthrax) in the month of January 1886, the cause of which I am unable to trace. Out of seventy-five attacked twenty-seven died. Many of them were saved by the early administration of large doses of carbolic acid and common salt; but the disease hung to the flock until they had a complete change of locality, when it at once became arrested.

37. *Publications.*—During the year I have written, in conjunction with Mr. Symonds, V.S., A.V.D., a Veterinary Pharmacopœia for the use of the students of the Agricultural College; also a Posological table for the use of the subordinates of my department. A Telugu translation of the Indian Stock-owner's Manual has been completed and will shortly be published.

38. I served on the Technical Education Committee held at Madras as ordered in G.O., dated 11th September 1885, No. 540; also on the Ploughing Exhibition Committee held on the 16th of November 1885.

39. *Compilation of Statistics.*—It has been decided by the Board of Revenue in their Proceedings, dated 25th January 1886, No. 2002, that it is the duty of this office to compile statistics of cattle mortality from all causes, including snake-bites, wild animals, &c. This arrangement will give a little extra labor, but the monthly and annual returns submitted by this office will be much more complete than they have been heretofore.

(Signed) J. MILLS, V.S., 1st Class,
Inspector of Cattle Diseases.

APPENDIX No. 1.—TO ENCLOSURE No. 2.

RETURN showing the number of inspections made and the districts visited by the Inspector of Cattle Diseases, the Deputy Inspector and the Probationers during the official year 1885-86.

District.	Inspectors.		Probationary Local Cattle Disease Inspectors.				
	Inspector.	Deputy Inspector.	V. Seethambara Devoo.	G. Rungiah Naidu.	M. Hassen Alí Sahib.	Total.	Remarks.
1. Anantapur	..	..	..	..	..	..	
2. Arcot, North	1	1	..	..	..	2	
3. Arcot, South	1	2	1	1	..	5	
4. Bellary	..	..	..	..	..	..	
5. Canara, South	..	1	..	..	..	..	
6. Chingleput	1	1	..	..	..	2	
7. Coimbatore	1	1	1	1	..	4	
8. Cuddapah	..	..	..	..	..	..	
9. Ganjam	..	..	..	..	..	..	
10. Godávari	..	..	..	..	..	..	
11. Kistna	..	1	..	..	..	1	
12. Kurnool	..	1	..	..	..	1	
13. Madras	..	..	..	..	1	1	
14. Madura	1	..	1	1	..	3	
15. Malabar	..	1	..	..	..	1	
16. Nellore	..	..	..	..	..	..	
17. Nílgiris	1	1	..	..	1	3	
18. Salem	1	1	..	..	2	4	
19. Tanjore	1	2	1	1	..	5	
20. Tinnevelly	1	1	1	1	..	4	
21. Trichinopoly	1	1	1	1	..	4	
22. Vizagapatam	..	..	..	..	..	..	
Total ..	10	15	6	6	4	41	

APPENDIX No. 2.—TO ENCLOSURE No. 2.

RETURN of the sick and lame animals admitted to the Government Veterinary Hospital for treatment during the official year 1885-86.

Number.	Disease.	Admitted.	Discharged.					Remaining.	Percentage of deaths on admission.	Remarks.
			Cured.	Relieved.	Incurable.	Died.	Destroyed.			
1	Abscess	6	5	..	..	..	..	1	..	
2	Anæmia	3	2	..	..	..	..	1	..	
3	Anasarca	1	1	..	..	..	..	..	..	
4	Anthrax	1	1	..	..	..	..	..	..	
5	Aphtha	2	2	..	..	..	..	..	..	
6	Apoplexy	1	..	..	..	1	..	..	100·00	
7	Braxy	75	48	..	..	27	..	..	36·00	Out-patients.
8	Bronchitis	1	1	..	..	..	..	..	..	
9	Bursal distention	2	2	..	..	..	..	..	..	
10	Bursattu	2	2	..	..	..	..	..	..	
11	Cancer	1	1	..	..	..	..	..	..	
12	Canker	3	3	..	..	..	..	..	..	
13	Castration	7	7	..	..	..	..	..	..	
14	Cataract Lenticular	1	..	..	1	..	..	..	..	
15	Colic	1	..	..	..	..	..	1	..	
16	Conjunctivitis	1	1	..	..	..	..	..	..	
17	Constipation	5	5	..	..	..	..	..	..	
18	Cracked heels	1	1	..	..	..	..	..	..	
19	Deafness	1	1	..	..	..	..	..	..	
20	Diarrhœa	1	1	..	..	..	..	..	..	
21	Dysentery	5	2	..	..	3	..	..	..	
22	Dyspepsia	4	4	..	..	..	..	..	..	
23	Eczema	1	1	..	..	..	..	..	..	
24	Enteritis	1	..	..	..	1	..	..	..	
25	Epistaxis	1	1	..	..	..	..	..	..	
26	Epizootic Aphtha	41	40	..	..	..	..	1	..	Out-patients.
27	Erythema Mammilarum ..	1	1	..	..	..	..	..	..	
28	Fever, Biliary	4	3	..	..	1	..	..	..	
29	Fever	11	11	..	..	..	..	..	..	
30	Filaria Oculi	1	1	..	..	..	..	..	..	
31	Fistulous wither	1	1	..	..	..	..	..	..	

Return of the sick and lame animals admitted to the Government Veterinary Hospital for treatment during the official year 1885-86—*continued.*

Number.	Disease.	Admitted.	Discharged. Cured.	Discharged. Relieved.	Discharged. Incurable.	Discharged. Died.	Discharged. Destroyed.	Remaining.	Percentage of deaths on admission.	Remarks.
32	Fracture	1	..	..	1	..	..	..	..	
33	Gleet	1	1	..	..	..	..	..	..	
34	Hepatitis	1	1	..	..	..	..	..	..	
35	Indigestion	1	1	..	..	..	..	..	..	
36	Inversion of Uterus	2	1	..	..	1	..	..	50·00	
37	Mammitis	1	1	..	..	..	..	..	..	
38	Marasmus	4	2	1	1	..	..	..	..	
39	Melanosis	1	..	..	1	..	..	..	..	
40	Navicular Arthritis	1	..	..	1	..	..	..	..	
41	Omphalitis	1	1	..	..	..	..	..	..	
42	Opacity of the Cornea ..	1	1	..	..	..	..	..	..	
43	Ophthalmia	1	1	..	..	..	..	..	..	
44	Paralysis	1	..	..	..	..	..	1	..	
45	Paraplegia	2	..	1	..	..	..	1	..	
46	Parasites	15	14	..	..	..	..	1	..	
47	Parturient Apoplexy	1	1	..	..	..	..	..	..	
48	Pleuro Pneumonia	2	1	..	..	1	..	..	50·00	
49	Pneumonia	2	..	..	..	2	..	..	100·00	
50	Poisoning	2	2	..	..	..	..	..	..	
51	Prurigo	3	3	..	..	..	..	..	..	
52	Retention of Placenta ..	1	1	..	..	..	..	..	..	
53	Rheumatism	17	14	1	..	1	..	1	5·88	
54	Rinderpest	3	3	..	..	..	..	..	..	Out-patients.
55	Saddle Gall	1	1	..	..	..	..	..	..	
56	Septicæmia	1	..	..	..	1	..	..	..	
57	Side-bone (ossified cartilage) ..	1	..	..	1	..	..	..	..	
58	Sit-fast	1	1	..	..	..	..	..	..	
59	Sore-back	1	1	..	..	..	..	..	..	
60	Sore-throat	4	4	..	..	..	..	..	..	
61	Spavin	1	..	1	..	..	..	..	..	
62	Splint	2	2	..	..	..	..	..	..	
63	Sprain	12	6	5	..	..	..	1	..	
64	Strangles	2	2	..	..	..	..	..	..	
65	Surfeit	1	1	..	..	..	..	..	..	
66	Tabes mesenterica	1	1	..	..	..	..	..	..	
67	Tetanus	1	..	..	..	1	..	..	100·00	
68	Tumour	4	4	..	..	..	..	..	..	
69	Tympanitis	2	2	..	..	..	..	..	..	
70	Ulcer	8	7	..	..	..	..	1	..	
71	Villitis	1	..	..	1	..	..	..	..	
72	Wound	43	39	1	..	2	1	..	4·65	
	Total ..	339	269	10	7	42	1	10	12·48	

ABSTRACT.

Remaining last year	15
Since admitted	324
Discharged cured	269
Relieved	10
Incurable	7
Died	42
Destroyed	1
Remaining on the 31st of March 1886 ..	10
Total ..	339

Animals admitted—	
Horses	105
Cattle	95
Sheep	103
Goats	3
Dogs	32
Antelope	1
Total ..	339

APPENDIX No. 3.—TO ENCLOSURE No. 2.

STATEMENT showing actual receipts and charges of the establishment of the Inspector of Cattle Diseases during the official year 1885-86 as compared with the budget estimate for 1885-86.

Items.	Sanctioned estimate.	Up to last month.	In this month.	Total.	Amount available on the 1st April 1886.	Minus.
Expenditure.	RS.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
Pay of Inspector of Cattle Diseases.	9,378	8,208 13 11	850 0 0	9,058 13 11	319 2 1	..
Do. Deputy Inspector of Cattle Diseases.	3,600	3,640 5 2	300 0 0	3,940 5 2	..	340 5 2
Do. Office clerk	300	275 0 0	25 0 0	300 0 0	..	..
Wages of office peon	72	66 0 0	6 0 0	72 0 0	..	..
Inspector's travelling allowances ..	900	1,174 2 0	..	1,174 2 0	..	274 2 0
Deputy Inspector's travelling allowances.	1,100	1,091 10 0	128 0 0	1,219 10 0	..	119 10 0
Pay of Hospital keeper	600	545 0 0	50 0 0	595 0 0	5 0 0	..
Wages of Hospital peon	74	66 0 0	6 0 0	72 0 0	2 0 0	..
Do. two Hospital mallies ..	146	132 0 0	12 0 0	144 0 0	2 0 0	..
Probationers' stipends	1,120	807 1 6	60 0 0	867 1 6	252 14 6	..
Do. travelling allowance..	300	334 15 6	..	334 15 6	..	34 15 6
Hospital expenses	1,475	1,111 12 11	261 8 6	1,373 5 5	..	78 5 5
Office tent		180 0 0	..	180 0 0		
District medicines	1,200	1,160 9 10	65 15 9	1,226 9 7	..	26 9 7
Upkeep of hospital	200	181 7 6	17 15 0	199 6 6	0 9 6	..
Anthrax inoculation	225	225 0 0	..	225 0 0	..	..
Experiments						
Contingencies						
Service labels		204 0 0	20 0 0	224 0 0		
Service telegrams		44 13 0	2 5 0	47 2 0		
Stationery, books, &c.	700	307 2 9	9 10 6	316 13 3	0 0 7	..
Contingencies		107 4 2	4 12 0	112 0 2		
Furniture		..	..	..		
Local Inspectors.						
Salaries	10,350	7,978 2 6	889 11 7	8,867 14 1	1,482 1 11	..
Travelling allowance	3,500	2,118 12 3	398 5 0	2,517 1 3	982 14 9	..
Coutingencies	1,000	407 6 7	148 9 9	556 0 4	443 15 8	..
	36,240	30,367 7 7	3,255 13 1	33,623 4 8	3,490 11 0 873 15 8	..
					2,616 11 4	
Receipts.						
Cash realized by treatment of horses, &c.	..	434 4 6	176 9 8	610 14 2	..	..
	..	..	..	610 14 2	..	..

APPENDIX No. 4.—to Enclosure No. 2.

Statistical return of cattle disease in the Presidency of Madras from the 1st of April 1885 to 31st March 1886, showing the number of attacks and deaths from various causes separately.

Name of district.	Abscess.		Anæmia.		Anthrax.		Apoplexy.		Bronchitis.		Cancer.		Carditis.		Catarrh.		Choking.		Colic.	
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.
1	2		3		4		5		6		7		8		9		10		11	
1. Anantapur	..	..	..	..	461	372	2	1	..	..	..	..	..	..	1	1	6	6	3	3
2. Arcot, North	..	..	..	..	424	226	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3. Arcot, South	..	..	..	..	1,751	1.653	5	5	..	..	..	..	..	..	160	141	..	..	3	3
4. Bellary	2	2	..	..	940	837	..	..	..	..	..	..	..	..	13	13	..	..	..	..
5. Canara, South	..	..	..	..	355	197	..	..	..	..	..	..	..	..	4	4	..	..	5	2
6. Chingleput	..	..	..	..	1,709	1,370	18	16	3	3	..	..	..	..	45	5	..	..	7	2
7. Coimbatore	..	..	..	..	511	237	..	..	104	63	..	..	26	5	11	8	16	15	3	1
8. Cuddapah	..	..	..	..	1,278	1,015	32	32	..	..	..	..	..	..	21	21	..	..	9	9
9. Ganjam	7	7	..	..	197	148	15	14	2	..	1	1	..	..	25	25	1	1	132	94
10. Godávari	No statistics received				..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Kistna	..	..	..	..	1,639	1,370	..	..	..	..	..	..	..	..	7	7	1	..	..	..
12. Kurnool	2	2	..	..	829	595	18	18	..	..	..	..	..	..	285	125	..	..	9	9
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14. Madura	1	..	..	..	598	499	4	2	2	2	..	..	..	..	3	2	..	..	5	4
15. Malabar	..	..	..	..	1,116	755	1	1	..	..	..	..	..	..	17	17	7	7	..	..
16. Nellore	..	..	..	..	700	559	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17. Nílgiris	..	..	..	..	49	46	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18. Salem	..	..	..	..	771	600	2	2	..	..	..	..	..	..	93	49	..	..	..	..
19. Tanjore	..	..	..	..	60	52	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20. Tinnevelly	..	..	..	..	522	421	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21. Trichinopoly	..	..	..	..	4	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22. Vizagapatam	..	..	5	..	628	532	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	12	11	5	..	13,542	11,487	97	91	111	68	1	1	26	5	685	418	31	29	176	127
Total for 1884-85	..	..	..	..	15,164	11,514	327	300	..	..	..	..	..	..	1,608	304	..	..	88	57
Do. for 1883-84	..	..	..	..	9,132	5,871	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Do. for 1882-83	..	..	..	..	767	563	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Statistical return of cattle disease in the Presidency of Madras from the 1st of April 1885 to 31st March 1886, &c.—*continued.*

Name of district.	Deformity.		Diabetes.		Diarrhœa.		Dropsy.		Dysentery.		Dyspepsia.		Eczema.		Enteritis.		Epilepsy.		Epizootic Aphtha.	
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.
	12		13		14		15		16		17		18		19		20		21	
1. Anantapur	..	..	..	..	4	4	..	..	76	30	..	..	..	..	1	1	..	..	62	1
2. Arcot, North	..	..	..	..	9	9	..	..	..	..	..	..	..	..	..	..	..	..	5,074	153
3. Arcot, South	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,711	226
4. Bellary	..	..	..	..	4	4	..	..	..	..	..	..	..	..	..	..	..	..	102	35
5. Canara, South	..	..	..	..	2	..	..	..	3	3	1	..	..	..	..	..	..	..	8,957	181
6. Chingleput	..	..	..	..	82	30	..	..	1	1	..	..	..	..	..	..	..	..	4,186	527
7. Coimbatore	..	..	..	..	102	60	8	7	30	28	..	..	..	..	7	7	..	..	32,947	434
8. Cuddapah	..	..	..	..	38	38	..	..	6	6	..	..	..	..	..	..	..	..	2,592	40
9. Ganjam	1	1	..	..	187	145	1	1	89	63	..	..	..	..	3	3	..	..	34	34
10. Godávari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Kistna	..	..	..	..	23	23	..	..	65	57	..	..	..	..	4	4	..	..	554	25
12. Kurnool	..	..	..	..	5	5	..	..	46	20	..	..	..	..	..	..	..	..	6,634	161
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	124	..
14. Madura	..	..	..	..	368	286	1	1	7	5	..	..	3	3	4	4	4	4	913	125
15. Malabar	..	..	..	..	18	18	..	..	4	4	..	..	..	..	..	..	..	..	4,317	694
16. Nellore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	366	..
17. Nilgiris	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	450	80
18. Salem	..	..	..	..	68	32	..	..	24	18	..	..	..	..	..	..	..	..	8,858	111
19. Tanjore	..	..	3	1	13	11	..	..	..	..	..	..	..	..	..	..	..	..	446	31
20. Tinnevelly	..	..	..	..	49	48	..	..	..	..	..	..	..	..	..	..	..	..	2,096	9
21. Trichinopoly	..	..	..	..	24	14	..	..	6	..	..	..	..	..	..	..	..	..	486	..
22. Vizagapatam	..	..	..	..	7	5	..	..	..	..	..	..	..	..	..	..	..	..	365	253
Total ..	1	1	3	1	1,004	732	10	9	357	235	1	..	3	3	19	19	4	4	86,274	3,120
Total for 1884-85	..	..	..	..	2,264	1,745	..	..	5,806	5,211	..	..	..	..	123	111	268	88	21,214	3,885
Do. for 1883-84	..	..	..	..	..	..	..	..	811	340	..	..	..	..	..	..	..	..	5,929	396
Do. for 1882-83	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	633	77

Statistical return of cattle disease in the Presidency of Madras from the 1st of April 1885 to 31st March 1886, &c.—*continued.*

Name of district.	Erythema Mammilarum.		Exposure.		Farcy.		Fever.		Gid.		Glanders.		Hæmaturia.		Hæmoptysis.		Hepatitis.		Hydrophobia.		Hydrothorax.	
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.
	22		23		24		25		26		27		28		29		30		31		32	
1. Anantapur	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2. Arcot, North	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3. Arcot, South	..	..	43	43	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..
4. Bellary	..	..	..	..	..	..	5	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5. Canara, South	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..
6. Chingleput	..	..	..	..	..	..	25	4	23	23	..	..	4	4	..	..	16	3	..	..	..	..
7. Coimbatore	..	..	..	..	..	..	1	1	..	..	..	..	5	5	..	..	..	..	7	7	..	..
8. Cuddapah	..	..	..	..	..	..	5	2	3	3	..	..	38	20	..	..	..	..	..	..	..	..
9. Ganjam	..	..	..	..	..	..	1	1	..	..	..	..	1	1	..	..	..	..	2	2	..	..
10. Godávari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Kistna	..	..	..	..	..	..	12	..	..	..	..	..	9	8	..	..	2	2	2	2	..	..
12. Kurnool	..	..	..	..	..	..	74	25	..	..	..	..	69	69	..	..	4	3	..	..	1	1
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14. Madura	..	..	..	..	..	..	7	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15. Malabar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16. Nellore	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17. Nílgiris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18. Salem	..	..	..	..	1	1	65	23	..	..	9	9	..	..	..	..	..	..	..	..	..	..
19. Tanjore	..	..	..	..	..	..	..	..	..	..	..	..	4	4	..	..	..	..	..	..	..	..
20. Tinnevelly	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21. Trichinopoly	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22. Vizagapatam	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Total ..	1	..	43	43	1	1	196	67	26	26	9	9	131	111	1	1	24	10	11	11	1	1
Total for 1884-85	..	..	..	..	..	..	4	..	..	..	8	8	185	166	..	..	28	26	2	2	..	..
Do. for 1883-84	..	..	..	..	..	..	..	..	..	..	..	..	3	3	..	..	..	..	..	..	..	..
Do. for 1882-83	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Statistical return of cattle disease in the Presidency of Madras from the 1st of April 1885 to 31st March 1886, &c.—*continued.*

Name of district.	Impaction.		Laminitis.		Mammitis.		Mange.		Megrinis.		Melanosis.		Nephritis.		Old age.		Ophthalmia.		Paralysis.		Parturition.	
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.
	33		34		35		36		37		38		39		40		41		42		43	
1. Anantapur	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	6	..	..	1	1	..	..
2. Arcot, North	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	9	..	..	..	..	..	..
3. Arcot, South	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4. Bellary	6	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5. Canara, South	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..
6. Chingleput	..	..	..	..	..	..	..	..	..	..	..	..	30	22	..	..	..	..	1	1	..	..
7. Coimbatore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8. Cuddapah	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9. Ganjam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	2	2	4	4
10. Godávari	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..
11. Kistna	..	..	..	..	..	..	..	..	..	..	1	1	..	..	4	4	..	..	1	1	1	1
12. Kurnool	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	4	..	..
14. Madura	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15. Malabar	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..
16. Nellore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17. Nílgiris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..
18. Salem	1	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19. Tanjore	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20. Tinnevelly	147	147	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21. Trichinopoly	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22. Vizagapatam	2	2	1	..	..	..	2	..	..	..	..	..	..	..	..	..	1	..	2	..	..	..
Total ..	158	158	1	..	4	..	2	..	2	2	1	1	32	24	22	22	1	..	13	11	5	5
Total for 1884-85	..	..	..	..	..	..	7	1	..	..	..	..	..	..	..	..	7	..	33	33	..	..
Do. for 1883-84	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Do. for 1882-83	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Statistical return of cattle disease in the Presidency of Madras from the 1st of April 1885 to 31st March 1886, &c.—*continued.*

Name of district.	Parturient Apoplexy.		Phrenitis.		Pleuritis.		Pleuro-pneumonia.		Pneumonia.		Retention of Placenta.		Rheumatism.		Rinderpest.		Rot.		Septicæmia.	
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.
	44		45		46		47		48		49		50		51		52		53	
1. Anantapur	..	..	2	2	..	..	40	14	..	..	1	1	..	..	57	39	..	..	..	..
2. Arcot, North	..	..	..	..	..	..	..	..	..	..	..	..	..	..	784	475	..	..	..	..
3. Arcot, South	..	..	..	..	..	..	..	..	7	7	..	..	..	..	367	226	..	..	..	..
4. Bellary	..	..	..	..	..	..	..	..	..	..	..	..	..	..	243	151	2	2	..	..
5. Canara, South	..	..	..	..	..	..	..	..	..	..	..	..	..	..	202	103	2	2	..	..
6. Chingleput	..	..	..	..	..	..	..	..	133	113	..	..	4	4	2,191	1,393	21	15	..	..
7. Coimbatore	..	..	..	..	..	..	..	..	15	15	..	..	2	2	153	128	41	41	..	..
8. Cuddapah	..	..	6	4	..	..	..	..	124	89	..	..	83	83	419	282	2	2	..	..
9. Ganjam	2	2	90	89	..	..	1	1	..	..	..	..	6	6	295	279	3	3	..	..
10. Godávari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Kistna	..	..	6	4	..	..	..	..	12	12	..	..	1	1	307	236	..	..	..	..
12. Kurnool	3	3	2	2	..	..	..	..	4	4	..	..	105	71	2,485	1,667	113	55	..	..
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14. Madura	2	2	..	..	..	..	..	..	675	559	..	..	1	1	8	3	2	2	3	3
15. Malabar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16. Nellore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3,244	1,493	..	..	..	..
17. Nilgiris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	3	..	..	..	..
18. Salem	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	29	..	..	..	..
19. Tanjore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	880	111	..	..	..	..
20. Tinnevelly	..	..	..	..	..	..	..	..	..	..	..	..	1	1	91	61	..	..	..	..
21. Trichinopoly	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	15	..	..	..	..
22. Vizagapatam	..	..	..	..	1	..	..	..	..	..	1	..	..	..	311	277	..	..	..	..
Total ..	7	7	106	101	1	..	41	15	970	799	2	1	203	169	12,109	6,971	186	122	3	3
Total for 1884-85	..	..	36	22	..	..	196	146	1,491	1,194	..	..	99	99	20,978	12,624	4,687	3,814	..	..
Do. for 1883-84	..	..	..	..	..	..	..	..	93	34	..	..	..	..	16,833	7,824	..	..	..	..
Do. for 1882-83	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31,614	18,950	..	..	..	..

Statistical return of cattle disease in the Presidency of Madras from the 1st of April 1885 to 31st March 1886, &c.—*continued*.

Name of district.	Tabes mesenterica. Attacked.	Tabes mesenterica. Died.	Tetanus. Attacked.	Tetanus. Died.	Tuberculosis. Attacked.	Tuberculosis. Died.	Tumour. Attacked.	Tumour. Died.	Tympanitis. Attacked.	Tympanitis. Died.	Variola Ovina. Attacked.	Variola Ovina. Died.	Variola Vaccina. Attacked.	Variola Vaccina. Died.	Ulcer. Attacked.	Ulcer. Died.	Wound. Attacked.	Wound. Died.	Drowning. Attacked.	Drowning. Died.
	54		55		56		57		58		59		60		61		62		63	
1. Anantapur	..	..	3	3	..	..	..	..	..	..	1,318	661	..	..	1	1	4	4	..	..
2. Arcot, North	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	..	..	..
3. Arcot, South	..	..	..	..	..	..	..	..	..	..	49	44	..	..	..	..	..	..	..	..
4. Bellary	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	5	5	..	..
5. Canara, South	..	..	..	..	..	..	..	..	15	13	..	..	..	..	..	..	..	..	..	..
6. Chingleput	..	..	..	..	..	..	..	..	10	1	..	..	..	..	..	..	..	..	..	..
7. Coimbatore	..	..	2	2	..	..	2	..	10	9	15	5	11	11	1	.	..	..	..	..
8. Cuddapah	..	..	2	2	..	..	..	..	4	4	1,208	768	..	..	..	..	..	..	..	..
9. Ganjam	..	..	11	7	26	26	..	..	68	48	145	92	394	308	..	..	2	2	..	..
10. Godávari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Kistna	..	..	10	9	..	..	..	..	2	2	40	40	..	..	..	..	..	..	..	..
12. Kurnool	1	1	..	..	..	..	..	..	4	4	662	181	..	..	1	1	..	..	..	..
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14. Madura	..	..	..	..	..	..	..	..	..	..	465	327	199	23	6	6	..	..	..	..
15. Malabar	..	..	..	..	..	..	..	..	88	77	..	..	4	4	..	..	..	..	..	..
16. Nellore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17. Nílgiris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18. Salem	..	..	2	2	..	..	..	..	1	0	357	128	321	3	..	..	..	..	..	..
19. Tanjore	..	..	..	..	..	..	..	..	5	4	..	..	..	..	4	4	..	..	..	..
20. Tinnevelly	..	..	..	..	..	..	..	..	11	8	100	..	..	..	2	..	1	1	..	..
21. Trichinopoly	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..
22. Vizagapatam	..	..	..	..	..	..	..	..	5	0	..	..	..	..	5	..	..	..	..	..
Total ..	1	1	30	25	26	26	2	..	226	173	4,359	2,246	929	349	20	12	32	12	..	..
Total for 1884-85	..	..	3	3	..	..	..	..	713	643	1,580	884	762	455	..	..	..	..	35,797	34,469
Do. for 1883-84	..	..	..	..	..	..	..	..	..	..	626	437	603	203	..	..	..	..	..	..
Do. for 1882-83	..	..	..	..	..	..	..	..	..	..	1,400	840	..	..	..	..	..	..	..	..

Statistical return of cattle disease in the Presidency of Madras from the 1st of April 1885 to 31st March 1886, &c.—*continued.*

Name of district.	Foreign bodies in the stomach.		Lightning shock.		Poisoning.		Premature birth.		Snake-bite.		Starvation.		Sunstroke.		Not specified.		Total.		Percentage of deaths on attacks.
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	
	64		65		66		67		68		69		70		71		72		73
1. Anantapur	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,049	1,151	51·29
2. Arcot, North	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,311	863	13·67
3. Arcot, South	..	..	1	1	..	..	..	..	10	10	..	..	..	..	24	23	9,142	2,393	26·17
4. Bellary	..	..	..	..	2	2	..	..	..	..	..	..	2	2	181	123	1,508	1,188	78·77
5. Canara, South	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	9,548	507	5 31
6. Chingleput	..	..	..	..	..	..	..	..	..	..	..	..	..	..	86	62	8,566	3,578	41·76
7. Coimbatore	..	..	..	..	1	1	..	..	2	2	..	..	..	..	15	..	34,079	1,117	3·27
8. Cuddapah	..	..	..	..	4	4	..	..	..	..	..	..	..	..	878	736	6,754	3,162	46·81
9. Ganjam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	129	126	1,860	1,537	82·63
10. Godávari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Kistna	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,437	696	4,135	2,500	60·45
12. Kurnool	1	1	..	..	5	5	..	..	..	..	..	..	..	..	182	92	11,551	3,127	27·07
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	124	..	..
14. Madura	..	..	..	..	..	..	..	..	3	3	..	..	..	..	189	61	3,478	1,937	55·69
15. Malabar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	8	5,582	1,587	28·43
16. Nellore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4,311	2,052	47·59
17. Nilgiris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	507	129	25·44
18. Salem	..	..	..	..	..	..	..	..	..	..	..	..	..	..	24	18	10,646	1,028	9·65
19. Tanjore	..	..	..	..	..	..	..	..	1	1	..	..	..	..	9	9	1,426	228	15·98
20. Tinnevelly	..	..	..	..	..	..	..	..	4	4	..	..	..	..	5	4	3,029	704	23·24
21. Trichinopoly	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	542	34	6·27
22. Vizagapatam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	1,341	1,069	79·71
Total ..	1	1	1	1	12	12	..	..	20	20	..	..	2	2	3,164	1,955	126,489	29,891	23·63
Total for 1884-85	..	..	..	..	67	46	2	2	5	5	573	469	..	..	4,762	3,395	118,890	81,724	68·73
Do. for 1883-84	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	33,733	15,108	41·46
Do. for 1882-83	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	34,414	20,430	59·36

APPENDIX No. 5.—TO ENCLOSURE No. 2.

STATISTICAL return of cattle disease in the Presidency of Madras from the 1st April 1885 to 31st March 1886 showing the percentage of attacks and deaths on strength from all causes.

No.	District.	Strength of cattle.	Number of cattle attacked.	Number of cattle died.	Percentage of attacks on strength.	Percentage of deaths on strength.
1	Anantapur	967,100	2,049	1,151	00·21	00·11
2	Arcot, North	914,188	6,311	863	00·69	00·09
3	Arcot, South	1,108,810	9,142	2,393	00·82	00·21
4	Bellary	535,904	1,508	1,188	00·28	00·22
5	Canara, South	550,383	9,548	507	1·73	00·09
6	Chingleput	480,338	8,566	3,578	1·78	00·74
7	Coimbatore	1,279,084	34,079	1,117	2·66	00·08
8	Cuddapah	2,079,884	6,754	3,162	00·32	00·15
9	Ganjam	249,964	1,860	1,537	00·74	00·61
10	Godávari	480,713	No statistics received.		..	..
11	Kistna	831,166	4,135	2,500	00·49	00·30
12	Kurnool	583,126	11,551	3,127	1·98	00·53
13	Madras	13,453	124	..	00·92	..
14	Madura	1,060,964	3,478	1,937	00·32	00·18
15	Malabar	920,406	5,582	1,587	00·60	00·17
16	Nellore	527,549	4,311	2,052	00 81	00·38
17	Nilgiris	32,971	507	129	1·53	00·39
18	Salem	1,214,939	10,646	1,028	00·87	00·08
19	Tanjore	1,435,177	1,426	228	00·09	00·01
20	Tinnevelly	1,267,972	3,029	704	00·23	00·05
21	Trichinopoly	1,413,548	542	34	00·03	00·02
22	Vizagapatam	98,099	1,341	1,069	1·36	1·08
	Total ..	17,845,576	126,489	29,891	00·70	00·16

APPENDIX No. 6 to Enclosure No. 2.

Supplemental statistical return of cattle diseases in the Presidency of Madras from the 1st of April 1885 to 31st of March 1886, showing the number of attacks and deaths from various causes separately.

Name of district.	Abscess.		Accidents.		Anæmia.		Apoplexy.		Anthrax.		Bronchitis.		Catarrh.		Colic.		Cough.		Constipation.		Choking.	
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.
1	2		3		4		5		6		7		8		9		10		11		12	
1. Anantapur	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2. Arcot, North	..	..	..	..	..	..	..	..	27	24	..	..	..	..	..	..	..	..	..	..	..	..
3. Arcot, South	..	..	..	..	..	..	..	..	749	515	..	..	..	..	..	..	..	..	..	..	..	..
4. Bellary	..	..	..	..	..	..	..	..	55	43	..	..	..	..	..	..	..	..	..	..	..	..
5. Canara, South	..	..	..	..	..	..	..	..	20	10	..	..	..	..	..	..	..	..	..	..	..	..
6. Chingleput	..	..	..	..	..	..	..	..	187	135	..	..	..	..	..	..	..	..	..	..	..	..
7. Coimbatore	..	..	..	..	..	..	..	..	23	22	..	..	..	..	..	..	3	3	..	..	..	..
8. Cuddapah	..	..	..	..	..	..	..	..	300	232	..	..	2	2	1	1	..	..	..	..	..	..
9. Ganjam	4	4	..	..	2	2	6	5	132	130	..	..	..	..	45	44	..	..	..	..	1	1
10. Godávari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Kistna	..	..	..	..	..	..	..	..	33	24	..	..	..	..	..	..	..	..	..	..	..	..
12. Kurnool	..	..	..	..	1	1	..	..	194	83	..	..	5	5	..	..	..	..	..	..	..	..
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14. Madura	..	..	..	..	..	..	..	..	..	..	..	..	21	6	..	..	..	..	..	..	..	..
15. Malabar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16. Nellore	..	..	..	..	..	..	..	..	878	360	..	..	..	..	..	..	..	..	..	..	..	..
17. Nílgiris	..	..	12	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18. Salem	..	..	..	..	..	..	..	..	52	23	..	..	..	..	4	3	..	..	..	..	1	1
19. Tanjore	..	..	..	..	..	..	..	..	80	21	..	..	..	..	..	..	3	3	..	..	..	..
20. Tinnevelly	..	..	..	..	..	..	..	..	109	48	1	..	..	..	..	..	..	..	..	..	..	..
21. Trichinopoly	..	..	..	..	..	..	..	..	3	3	..	..	..	..	..	..	..	..	..	..	..	..
22. Vizagapatam	..	..	..	..	..	..	..	..	75	75	..	..	..	..	..	..	..	..	1	1	..	..
Total ..	4	4	12	12	3	3	6	5	2,918	1,748	1	..	28	13	50	48	6	6	1	1	2	2

Supplemental statistical return of cattle diseases in the Presidency of Madras from the 1st of April 1885 to 31st of March 1886, &c.—*continued.*

Name of district.	Diarrhœa.		Dysentery.		Diabetes.		Diphtheria.		Dyspepsia.		Eczema.		Enteritis.		Epizootic aphtha.		Fever.		Fistula.	
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.
	13		14		15		16		17		18		19		20		21		22	
1. Anantapur	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	..	..	..	..	..
2. Arcot, North	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,929	11	..	..	..	..
3. Arcot, South	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5,496	89	..	..	..	..
4. Bellary	1	1	..	..	..	..	..	..	..	..	..	..	..	..	222	..	..	..	..	..
5. Canara, South	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1,550	164	..	..	..	..
6. Chingleput	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4,007	154	..	..	..	..
7. Coimbatore	1	1	4	..	..	..	..	..	..	..	..	..	..	..	460	4	2	2	..	..
8. Cuddapah	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,522	82	1	1	..	..
9. Ganjam	83	82	22	22	1	1	1	1	..	..	..	..	1	1	12	9	..	..	1	1
10. Godâvari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	382	4	..	..	..	..
11. Kistna	..	..	..	..	..	..	..	..	..	..	..	..	..	..	429	..	..	..	..	..
12. Kurnool	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,471	19	2	2	..	..
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	61	23	..	..	..	..
14. Madura	..	..	..	..	..	..	..	..	..	..	..	..	..	..	800	..	16	..	..	..
15. Malabar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	166	1	..	..	..	..
16. Nellore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,442	14	..	..	..	..
17. Nilgiris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	70	..	..	..	..	..
18. Salem	1	..	..	..	..	..	..	..	8	8	50	34	..	..	4,004	97	..	..	..	..
19. Tanjore	17	14	..	..	..	..	..	..	..	..	..	..	..	..	2,311	103	..	..	..	..
20. Tinnevelly	..	..	..	..	..	..	..	..	..	..	..	..	..	..	828	1	..	..	..	..
21. Trichinopoly	125	2	..	..	..	..	..	..	..	..	..	..	..	..	837	1	..	..	..	..
22. Vizagapatam	5	4	5	2	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Total ..	235	104	31	24	1	1	1	1	8	8	50	34	1	1	30,010	776	21	5	1	1

Supplemental statistical return of cattle diseases in the Presidency of Madras from the 1st of April 1885 to 31st of March 1886, &c.—*continued.*

Name of district.	Hæmaturia.		Hepatitis.		Hæmorrhage.		Impaction of omasum, &c.		Killed by wild animals.		Natural decay.		Other diseases.		Parturition.		Parturient apoplexy.		Phrenitis.	
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.
	23		24		25		26		27		28		29		30		31		32	
1. Anantapur	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2. Arcot, North	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3. Arcot, South	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4. Bellary	..	..	..	..	..	..	5	5	..	..	..	..	17	12	..	..	..	..	..	..
5. Canara, South	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6. Chingleput	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7. Coimbatore	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
8. Cuddapah	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
9. Ganjam	..	..	..	..	2	2	..	..	..	..	..	..	..	..	5	5	6	5	77	77
10. Godávari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Kistna	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12. Kurnool	6	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14. Madura	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15. Malabar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16. Nellore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17. Nílgiris	..	..	..	..	..	..	..	..	5	5	8	8	..	..	..	..	..	..	..	..
18. Salem	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19. Tanjore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20. Tinnevelly	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21. Trichinopoly	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22. Vizagapatam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	10	10	1	1	2	2	5	5	5	5	8	8	18	12	5	5	6	5	78	78

Supplemental statistical return of cattle diseases in the Presidency of Madras from the 1st of April 1885 to 31st of March 1886, &c.—*continued.*

Name of district.	Pneumonia.		Poisoning.		Rabies.		Rheumatism.		Rinderpest.		Rot.		Rickets.		Septicæmia.		Sunstroke.		Snake-bite.	
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.
	33		34		35		36		37		38		39		40		41		42	
1. Anantapur	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2. Arcot, North	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3. Arcot, South	..	..	1	1	..	..	..	..	12	11	..	..	..	..	..	..	..	..	..	..
4. Bellary	..	..	..	..	..	..	..	..	480	226	..	..	..	..	..	..	3	3	..	..
5. Canara, South	..	..	..	..	..	..	..	..	191	98	..	..	..	..	..	..	..	..	..	..
6. Chingleput	..	..	..	..	..	..	2	2	129	91	..	..	..	..	..	..	..	..	..	..
7. Coimbatore	..	..	..	..	..	..	..	..	10	10	..	..	..	..	..	..	..	..	..	..
8. Cuddapah	1	1	4	4	..	..	3	2	590	387	..	..	..	..	..	..	..	..	..	..
9. Ganjam	..	..	..	..	4	4	7	7	29	28	5	5	3	3	2	2	..	..	..	..
10. Godávari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Kistna	..	..	..	..	..	..	..	..	142	73	..	..	..	..	..	..	..	..	..	..
12. Kurnool	..	..	..	..	..	..	3	3	274	164	..	..	..	..	..	..	..	..	..	..
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14. Madura	4	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15. Malabar	..	..	..	..	..	..	..	..	7	7	..	..	..	..	..	..	..	..	..	..
16. Nellore	..	..	..	..	..	..	..	..	2,462	907	..	..	..	..	..	..	..	..	..	..
17. Nílgiris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18. Salem	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19. Tanjore	..	..	..	..	..	..	..	..	1,681	40	..	..	..	..	..	..	..	..	2	2
20. Tinnevelly	..	..	..	..	..	..	..	..	42	26	..	..	..	..	..	..	..	..	..	..
21. Trichinopoly	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22. Vizagapatam	..	..	..	..	..	..	..	..	25	25	..	..	..	..	..	..	..	..	..	..
Total ..	5	5	5	5	4	4	15	15	6,074	2,093	5	5	3	3	2	2	3	3	2	2

Supplemental statistical return of cattle diseases in the Presidency of Madras from the 1st of April 1885 to 31st of March 1886, &c.—*continued.*

Name of district.	Skin disease.		Tetanus.		Tuberculosis.		Tympanitis.		Unknown.		Variola caprinæ.		Variola ovina.		Variola vaccinia.		Wounds.		Total.		Percentage of deaths on attacks.
	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	Attacked.	Died.	
	43		44		45		46		47		48		49		50		51		52		53
1. Anantapur	..	..	3	2	..	..	..	..	9	..	4	4	19	11	..	..	..	..	45	17	37·77
2. Arcot, North	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	2	1,976	37	1·87
3. Arcot, South	..	..	..	..	..	..	..	..	7	6	..	..	..	..	..	..	..	..	6,265	622	9·92
4. Bellary	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	783	290	37·03
5. Canara, South	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,763	272	15·42
6. Chingleput	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4,327	384	8·87
7. Coimbatore	..	..	..	..	..	..	1	1	2	2	..	..	..	..	..	..	..	..	507	45	8·87
8. Cuddapah	..	..	..	..	..	..	..	..	..	..	3	2	271	169	..	..	..	..	3,699	884	23·89
9. Ganjam	1	1	1	1	5	5	54	44	1	1	2	2	..	..	253	144	..	..	768	639	83·20
10. Godávari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	382	4	1·04
11. Kistna	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	604	97	16·05
12. Kurnool	..	..	..	..	..	..	1	1	..	..	..	..	415	100	..	..	..	..	2,372	384	16·14
13. Madras	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	61	23	37·70
14. Madura	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	843	12	1·42
15. Malabar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	173	8	4·62
16. Nellore	..	..	..	..	..	..	..	..	..	..	..	..	5	1	..	..	..	..	5,787	1,282	22·15
17. Nílgiris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	95	25	26·31
18. Salem	..	..	..	..	..	..	1	..	..	..	..	..	3	1	279	..	..	..	4,403	167	3·65
19. Tanjore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4,092	181	4·42
20. Tinnevelly	..	..	..	..	..	..	2	2	..	..	..	..	..	..	20	16	..	..	1,005	96	9·55
21. Trichinopoly	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	965	6	0·62
22. Vizagapatam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	113	107	94·69
Total ..	1	1	4	3	5	5	59	48	19	9	9	8	713	282	552	160	20	2	41,028	5,582	13·60

GOVERNMENT ORDER, 7TH MARCH 1887, NOS. 245, 245A, R.D.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—Proceedings of the Board of Revenue, dated 17th November 1886, No. 2497.

ABSTRACT.—Submitting to Government, with remarks, report from the Director of Revenue Settlement and Agriculture on the administration of the Agricultural Department for 1885-86.

Resolution—dated 17th November 1886, No. 2497.

Submitted to Government. The Board will notice only the agricultural portion of the work.

2. I. *Village records.*—The scheme of the new Revenue Inspector's Survey test was sketched out, and the new taluk and village manuals were approved of by Government.

3. II. *Famine analysis of districts.*—Work was continued, with five agricultural inspectors, in the Kurnool district; the Assistant Director also spent six months there and succeeded in roughly mapping out the whole district, except the two taluks of the Cumbum division, into eleven different agricultural tracts; the collection of statistics for these tracts continues, but will take time, the existing village accounts having been found misleading, and the work, with perhaps the exception of the crop returns, having to be redone, virtually *ab initio*.

4. III. *Collection of revenue.*—The rainfall was excessive in South Arcot and Chingleput and deficient in Ganjam, and the crops suffered in consequence; the planters on the Nílgiris and Shevaroys suffered also from the depression of trade and leaf-disease; in each case Collectors were authorised to suspend collections at their discretion; in the case of Ganjam, work was found for the distressed on the Chilka lake canal and on the Rushikulya works.

5. IV. *Measures of protection.*—Forest and fodder reserves will be dealt with in the forest report; the other subjects that the Director notices are the progress of the Bellary-Kistna and Cuddapah-Nellore protective railways to be finished, the latter in 1887 and the former in 1888; the sanction of the Periyár irrigation project, though, for want of funds, the work has not been commenced; the satisfactory expenditure of 2½ lakhs, 93 per cent. of the allotment on minor irrigation works, and the issue of new and more favorable rules to govern the grant of loans to ryots.

6. The Superintendent of the School of Arts visited the northern districts during the year, and prepared an elaborate and detailed census of the art-industries of those districts, which, besides its present value as an addition to knowledge, will also be a most useful guide to any measures of relief which may be required in future famines; it shows that the weaving industry in all its branches has declined, though not beyond the power of revival.

7. Experiments in diversified cropping on wet land were being arranged, in view to ascertain how far it will be possible in future times of drought to make a given amount of irrigation water go its furthest.

8. V. *Agricultural experiments and farms.*—The Government farm at Saidápet ceased to exist as an experimental farm in the year; it had been in existence for twenty years, but the result in the shape of increased knowledge of the conditions of Indian agriculture was not commensurate with its cost; a portion of its land was transferred to the School of Agriculture, which had some years previously become a branch of the Educational department, and the rest remains with the Director, but arrangements will probably be eventually made to hand it over to the Forest department for use as a nursery, and perhaps an arboretum.

9. The somewhat similar private experimental farms of the presidency may be mentioned; they are the following: the Madura farm, started in 1883 by an association of local landholders, styling themselves the Madura Farmers' Club, and assisted to a certain extent by a small Government grant; the Karúr farm maintained without Government assistance by Mr. Little, a missionary; and Mr. Kistnasawmi Mudaliar's private estate at Shiyáli; the first and the last were visited during the year by the Assistant Director, and, the latter especially, were found to show intelligence and enterprise.

10. In this connection, it may be mentioned that the Director also visited the Eurasian settlements near Bangalore in the year under report, and found the settlers, who are mostly Eurasians or domiciled Anglo-Indians, possessed of small means of their own, comfortably, healthily and profitably employed in farming operations, similar to those of their native neighbours. The settlement has been formed under the auspices of the Eurasian and Anglo-Indian Association of Southern India, and its object is to attract to the soil a portion of the industry of the Eurasian and domiciled Anglo-Indian community. The Director reported most favorably on it, and there can be no doubt that it deserves the good wishes of Government. An Aden bull and a donkey stallion were, at the instance of the Director, lent to the settlers.

11. The introduction of improved appliances to the ryots of the mofussil was proposed to be accomplished by ploughing matches, exhibitions, and travelling shows, but only the first and the last were actually attempted, the exhibitions proposed to be held at Erode and Gooty having, on account of the badness of the harvest, been postponed to the current year. A travelling show under the superintendence of the Assistant Director was proposed, and being sanctioned, eventually visited the chief districts of the south, and exhibited for two months to large audiences of ryots the working of improved ploughs, seed-drills and other implements; lectures were also given at places; a member of one of the leading Madras firms accompanied it with a supply of ploughs for sale, and sold 300. A ploughing match was held in Kurnool, but it was not a success, and proposals are now before Government to eliminate the ploughing match altogether from the programme of the Agricultural department and to substitute for it the very much more successful and adaptable travelling show.

12. A private travelling show conducted on his own account, through his native district, by Mr. Swami Iyengar, a native gentlemen of Tinnevelly, who is a student of the Agricultural College, deserves to be recorded; Government lent him the instruments to be exhibited, but otherwise he conducted the show himself with great success and with a considerable resultant demand for ploughs of the improved sort.

13. Though Government held no exhibition itself, it contributed Rs. 500 to a fairly successful one, which the Madura Farmers' Club held, and it offered a similar contribution to one which it was proposed to hold at Rajahmundry but which never came off; a collection of raw and worked products was also forwarded by the department to the London Exhibition.

14. In regard to new implements, trial was only made of three sugar mills and of one sugar evaporator; the latter, Cook's automatic evaporator from America, was a new implement, and its working being hardly understood, the result was inconclusive; the former, the Beheea 3 and 2 rollers and the American "Victor" were tried against the native mill, with the result that the cost of crushing per ton of sugar made was estimated at from Rs. 14 to Rs. 21 for the three improved mills, and at Rs. 104 for the native mill.

15. In regard to plants and seeds, the Assistant Director reports that at Saidápet the Eucalypts, *Tereticornis*, *Panniculata*, and *Citriodora*, did well; that the paper mulberry "grew fairly," and that the divi-divi "continued to flourish," the Australian salt bushes on the other hand were destroyed by floods; he mentions particularly an indigo crop grown from Cawnpore seed, the plants of which "averaged from 6 to 12 feet in height with numerous branches;" this would seem to be a variety worth distributing.

16. Experiments were also made in the districts to which considerable quantities of seed, mainly of varieties of maize, sorghum, cotton, wheat and paddy, were sent by the department; the results were inconclusive, though generally unsuccessful; the only successes appearing to have been maize, bringals, tobacco on the hills and the edible cactus on the hills; wheat, sorghum and tobacco, the edible cactus and eucalypts on the plains appear to have been failures; the large quantities of wheat

and barley sent to the Nílgiris for trial, must be considered a special experiment; of these, the wheat was inconclusive, but the barley has lately been reported to be a success.

17. In regard to products, the babul bark and pods sent home were found practically valueless, and the fibre of the fruitless Manilla hemp, as also tested at home, was declared to be but little superior to that of the common edible plantain; on the other hand, samples of Godávari tobacco sent to the Poosa factory to be tested were found good and suitable for the European market.

18. The following three very important matters were also taken up in a preliminary way in the year—ensilage, the introduction of the Persian date, and the creation of a silk industry. In regard to the first, the arrangements since made have consisted in placing funds at the disposal of various civil officers for purposes of experiment, and in calling on the co-operation of the Forest department; the results will appear only in the current year, but it may be mentioned that it is the first time in the history of the department that the subject has been in any way properly taken up. In regard to the edible date, steps were taken to procure offsets and seeds from Busreh through the agency of Messrs. Gray, Mackenzie and Co.; both seeds and offsets have since arrived, and have been planted out under the superintendence of the Forest department, it is hoped, successfully, and further proposals are now before Government for the continuance of a regular annual supply from the same quarter. In regard to silk, the matter is still only in the preliminary stage, but it is hoped that definite and feasible proposals will shortly be made, in view to the establishment, under the sole charge of the Forest department, of Government cocoon farms in selected places on the borders of Government forests; the "Myletta Silk Mills," now fairly established in Madras under the management of Messrs. Deschamps and deGuingné, undertaking to purchase at a fair price all the cocoons that these Government farms may be able to produce. Similar cocoon farms, belonging to private ryots, are said to be numerous and profitable in the Central Provinces, and it is hoped, therefore, that after a few years of Government working, just to start the industry, such private farms may eventually become numerous and profitable in the Madras Presidency.

19. Locusts did damage in Madura and Trichinopoly; an insect damaged the paddy crops in Tinnevelly; the tobacco parasite attacked Godávari and Kurnool; smut and rust also attacked the wheat and cholum in the latter district, and the different pulse crops suffered from various insects engendered during the cloudy weather; a small vegetable parasite also was observed growing on the root of the white cholum. The knowledge of plant diseases in this country, however, appears to be small, and the Board are not aware of any treatise or monograph on the subject similar to that, for instance, which is to be found on pages 64—119 of the United States Patent Office report for 1855 (Agriculture); a similar monograph for this presidency would be most useful, and some steps, the Board think, should be taken for its compilation.

20. VI. *Cattle-breeding and Veterinary Inspection.*—Not much would appear to have been done in the year under the first head; discussion was, however, going on, which has since resulted in the adoption of a definite plan of operation for the future; instead of a central breeding farm, a central depôt is to be made use of; instead, that is, of spending time and money in breeding stock which may after all turn out to be not what is wanted, and which when bred will have no appreciable effect on the stock of the country, the speedier and more practical plan is to be adopted of buying selected sires, and of drafting them so soon as they are mature to the different districts for free and immediate use; sites for the depôts at which these bulls shall be temporarily herded are therefore now being sought, though so far without much success; most of the sites available are, as might be expected, either dry or feverish, and the required combination of all good qualities in one site is not to be easily found.

21. In pony breeding, also, but little was done, but here, too, discussion was going on which has since resulted in the adoption of more energetic and systematic measures; the purchase of some 6 or 7 stallions has been sanctioned, operations are being concentrated on two special tracts, and a trained professional man has been put in charge; with these measures, it is hoped that there may be more to report at the end of the current year than there is now, when the sum total of the year's work is represented by but one foal dropped, and one stallion, out of a stud of two, shot for windstroke. Government have further under contemplation an extended scheme for training

salustries (native horse doctors) to be sent out to the districts, and will allow a grant of Rs. 3 to the owner of each pony castrated by these men. They thus hope to get at the *fons et origo* of all ill-breeding in this country.

22. An interesting record of the doings of the now abolished Saidápet farm in the matter of improving the breeds of country cattle and sheep during the last three years will be found in paragraphs 30—47 of the Assistant Director's report.

23. For the prevention of cattle disease, the measures taken were the same as in the year before; for head-quarters, there was the veterinary hospital at Saidápet, and for the mofussil there was a local inspector attached to each of the 17 districts out of the 22 that form the Presidency; the inspector and deputy inspector at the head of this branch of the department spent a part of their time at the head-quarters hospital teaching and working, and part in the districts on tours of inspection; the teaching forms a part of the curriculum of the adjoining Agricultural College.

24. The work done at the Saidápet hospital was nearly double that of the preceding year, a gratifying proof of the growing popularity of the institution; 339 cases were admitted and 279 were discharged cured.

25. Experiments were also conducted by the Inspector, Mr. Mills, in regard to the use of cocaine as a local anæsthetic for eye operations, and in regard to protection by inocculation from anthrax; both experiments were successful, but difficulty was felt in the latter in obtaining a cheap and certain supply of the necessary anthracine, and it was evident that the question would become a practical one only when it would be possible to manufacture anthracine in the country. It is to be hoped that Mr. Mills will continue his experments in this direction.

26. Up country the local inspectors did what they could to prevent and cure disease, but the effect was presumedly small, for no figures are given on the subject; this branch of their duty should not be lost sight of in future reports; the registration of cattle disease, on the other hand, seems fairly complete, if, as the Director suggests is not the case, Government can attach much value to the figures; such as they are, however, they show that out of over 17 millions of cattle at the Presidency, only one-eighth of a million were attacked, and of these only 30,000 died; anthrax, rinderpest and epizootic aphtha were the most fatal diseases. Steps are now being taken under the orders of Government to check these figures.

27. VII. *Statistics of Agriculture.*—The main work done in this direction was the collection and issue to the public of figures showing the state of the crops; three such issues were made, showing, respectively, the sowings, the intermediate growth and the harvest; the Director shows in a table the last, *i.e.*, the harvest, for the year under report. It is hoped that these figures will become reliable and the issue of them punctual; in which case they should be of considerable use to the commercial public.

28. VIII. *Statistics of Trade.*—These also were issued to the public at stated intervals, and as they are fairly reliable, they are believed to be of use; they show that the total external trade of the Presidency for the year amounted to 20 crores of rupees, of which 8½ were imports and 11½ exports.

29. *General.*—The strength of the Agricultural establishment and its cost during the year were as follows; it must be understood that it deals with only a portion of the subjects dealt with in the Director's report, and that the rest is dealt with by the ordinary revenue and other establishments of the Presidency:—

Actuals of the Agricultural establishments for 1885-86 exclusive of all miscellaneous charges, such as district operations, hospital expenses, medicines, stallion charges, &c.

Items.	Amount.
1. Agricultural Services—	RS.
1 Assistant Director of Agriculture	9,069
Office establishment	2,098
Travelling charges	1,794
Contingencies, &c.	438
Total ...	13,399

Items.		Amount.
2. Cattle-disease inspection—		RS.
1 Inspector and 1 Deputy Inspector of Cattle Diseases and establishment		13,371
Hospital establishment		811
Stipends to 8 Probationary Local Cattle Disease Inspectors ...		867
Travelling charges		2,729
Contingencies, &c.		700
18 Local Cattle Disease Inspectors.	Salaries	8,868
	Travelling allowances	2,517
	Contingencies	556
	Total ...	30,419
	Grand Total ...	43,818

(Signed) H. A. SIM,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.

Copy to the Director of Revenue Settlement and Agriculture.

ORDER—dated 7th March 1887, No. 245, Revenue.

Miscellaneous.

The Board of Revenue submit the administration report of the Director of Agriculture for the year 1885-86.

Before dealing with agricultural subjects proper, the Director briefly reviews the operations of the other departments under his control. These have, however, been dealt with by Government in separate orders and it is therefore unnecessary to here make any further allusion to them. There appears to be no need for their inclusion in a report dealing with the subject of agriculture and they, therefore, may in future be omitted.

2. *Village Records.*—During the year under review, the scheme for the Survey test to be passed by Revenue Inspectors was laid down and the necessary orders to give effect to it were issued. The Committee appointed to revise the village and taluk manuals submitted their report, and their proposals having received the approval of Government, the new forms of accounts have been introduced. It is anticipated that considerable advantages, both on the score of accuracy and simplicity, will follow on the adoption of the revised forms.

3. *Famine Analysis of Districts.*—The Director regrets that it has been possible to make but little progress in this work during the year under report: operations were confined to the Kurnool district. There can be no doubt that, as at present carried out, the preparation of a famine analysis involves a very considerable amount of labor and expenditure of time. Government have, however, under consideration recent proposals of the Board of Revenue suggesting modifications in the existing methods, and it is to be hoped that it will be found practicable to adopt a system under which the work will advance more rapidly than heretofore and will embrace, at an early date, all those districts specially liable to famine.

4. *Collection of Revenue.*—The question of the revision of the kistbundi (instalments in which the assessment due by ryots is paid) has recently, and after careful consideration, been disposed of by Government in the marginally-noted order, the effect of which, it is expected, will be that ryots will be relieved of considerable annoyance and officials of much extra work and that the collection of the revenue will be appreciably accelerated. Floods in Chingleput and South Arcot, and want of rain in Ganjam, led to the temporary suspension of the collection of revenue in parts of those districts.

G.O., dated 24th November 1886, No. 1033.

5. *Measures of Protection.*—The Director states his inability to give any information with regard to reserved forests or reserved lands. Arrangements to supply, in

future reports, this want, should be made. As regards the subject of diversified cropping Government have, since the receipt of the Director's report, decided that the experiments should, for the present, be abandoned.

The opening of the first two of the railways, mentioned at paragraph 27 of the report, will no doubt prove a substantial protection against famine to the parts of the country through which they run. Government regret that there is, at present, but scant prospect of the Periyár project being taken in hand. The allotment for the upkeep of minor irrigation works was, for the most part, utilized. The expenditure under this head was, however, considerably less than in the previous year. The rules recently framed under the Land Improvement Loans Act were not introduced until after the close of the year under review, and it is, therefore, impossible to speak as to their operation.

Native Arts and Manufactures.—During the year Mr. Havell, the Superintendent of the School of Arts, made a tour in the southern districts. As his careful and interesting report has been separately reviewed by Government, no further notice of it is here called for.

6. *Agricultural Experiments including Farms.*—The Saidápet Farm, *qua* farm, was finally closed on September 1st, 1885. The Assistant Director Mr. Benson has submitted a history of its working since its establishment. As the decision to abandon it as an experimental farm was arrived at after a full consideration of all the arguments *pro and con*, Government consider it undesirable that the policy of that conclusion should be further discussed. A portion of the farm has been transferred to the School of Agriculture and the remainder of it is, at present, in the charge of the Agricultural Department. The two private experimental farms at Madura and Karúr are reported to be in a condition which may be considered as fairly satisfactory. Government were much pleased to receive the favorable account of the late Acting Director Mr. Glenny as to the condition of the Eurasian Colony near Bangalore.

7. *Exhibitions and Ploughing Matches.*—One ploughing match was held during the year in the Kurnool district. The result was unsatisfactory and, on the recommendation of the Director and Board of Revenue, it has since been decided to abandon ploughing trials of this description, substituting in their place travelling shows. One of these latter, under the superintendence of the Assistant Director, assisted by Mr. Swami Iyengar, a student of the Agricultural College, who has shown a laudable interest in the improvement of agricultural implements, visited the principal southern districts during the year 1886. It has been, on the whole, considered by Government sufficiently successful to warrant their directing the continuance of the experiment. One of the noteworthy results of that referred to was the sale to ryots of a considerable number of improved ploughs by the agent of an enterprising firm, who accompanied the Assistant Director's party.

8. It had been intended to hold agricultural exhibitions at Gooty and Erode during the year under review, but, owing to the unfavorable nature of the season and financial pressure, the idea had to be abandoned. Arrangements to hold exhibitions at these places during the current year, are, however, in progress. The Farmer's Club, Madura, held a successful agricultural show in May 1885; it is a matter for regret that this was not repeated during 1886.

9. A trial of three new sugar-mills and a sugar evaporator was made at Shiyáli on the estate of Mr. C. Kistnasawmi Mudaliar, whose death Government have recently had occasion to deplore. The results conclusively demonstrated the immense superiority of the new mill over that in ordinary use, but nothing further appears to have been the outcome of the experiment. The essays made with seeds distributed by the Agricultural Department have, as a rule, resulted unsatisfactorily. This was probably due to the fact that the Revenue officers, to whom the seeds were for the most part sent, are too fully occupied with other work to be able to give the necessary time and supervision to testing them. It is at present, of course, impossible to provide a separate agency for the conduct of experiments of this kind, and Government have, therefore, decided to abandon them except in very special cases.

10. *Products.*—Government note, with regret, that it has been found impracticable to obtain a remunerative market in England for Bábul pods and bark, and that the fibre prepared from Manilla hemp has proved a failure. It is obviously undesirable to make any further attempt in these directions. The fact that a company has been formed in Madras for the purpose of reeling cocoons of the indigenous tusser silk-worm

and has actually commenced work, is encouraging. Government await with interest the results of the inquiries now being made with reference to the proposals of Mr. Donner. Favorable results have been obtained in some special experiments with English and Punjab barley on the Nílgiris. The English barley seems to have been a decided success. A trial of wheat was also made, but so far as it has gone, the results have not been satisfactory. The reports, however, on the samples of Godávari tobacco are encouraging, and Government trust that ere long they will be in a position to materially assist in the development of the important industry of growing and preparing tobacco. Seeds and off-sets of the edible Arabian date-palm (*Phœnix dactylifera*) have been distributed in various portions of the Presidency. There seems good reason to anticipate that localities will be found suited to its growth.

11. The Board of Revenue, in paragraph 19 of their Resolution, suggest that a treatise or monograph on the plant diseases and parasites of this country should be compiled. Government consider that agricultural knowledge has hardly developed in India sufficiently to allow of such a work being taken in hand with any prospect of results at all commensurate with the expenditure which the preparation of it would involve.

12. *Cattle-breeding, &c.*—Not much was done in this direction during the year under review, but the future policy of Government in this respect was discussed and it was decided to establish, instead of stock-breeding farms, central depôts in suitable localities, where selected bulls might be temporarily herded until fit to draft out to districts where their services would be required, and measures to obtain sites suitable for the purpose are in progress. The results of the pony-breeding experiment in Coimbatore were anything but encouraging. It is, however, hoped that the arrangements recently made, will, in the future, produce good results. The undertaking is one of considerable importance and should receive the careful and constant attention which it merits. Orders approving of the scheme, alluded to in paragraph 63 of the Director's report, have lately been issued and there is now a prospect of gradually and, eventually, successfully grappling with what the Director rightly observes is one potent cause of the deterioration of stock in this country, viz., the neglect to castrating bulls until three or four years old and allowing them to breed too young. The experiments with regard to ensilage during the year under review produced no practical results, but Government await with interest the report upon the trials on an extended scale, which are now being carried on by selected officers, and trust that the outcome of these will be the introduction into general use of a valuable adjunct to the support of stock during the hot months.

13. The Cattle-disease Inspection Department seems to have worked satisfactorily. The large increase in the work done at the Saidápet Veterinary Hospital is gratifying and is creditable to Mr. Mills. Government note that that officer has made successful experiments with cocaine as a local anæsthetic and with anthrax vaccine. From a recent correspondence with the Government of India it has been ascertained that it is proposed to establish in India a manufactory of this vaccine to which Government have expressed their readiness to afford support. It is to be hoped that the effect of this will be to secure another aid towards the preservation of agricultural stock and the consequent amelioration of the condition of the cultivating classes, on the well being of which the prosperity of the country so much depends.

Epizootic aphtha, anthrax and rinderpest were the most prevalent diseases amongst stock. Anthrax, as usual, proved the most fatal.

14. The Director alludes to the unreliability of the cattle statistics of the Presidency. Government are alive to this defect and have issued orders the effect of which, if carried out, will no doubt be an improvement in a very important branch of agricultural statistics.

15. It is observed that, notwithstanding the remarks made at paragraph 14 of the review of last year, nothing is said with regard to intentional cattle-poisoning, a matter of grave importance and one which was very properly alluded to in the Director's previous report (paragraph 80). This omission should now be explained, and any information that is available on the subject should be submitted.

16. The question of the appointment of an Inspecting Veterinary officer to supervise the local Cattle-disease Inspectors is still under correspondence with the Government of India.

17. Forecasts and reports showing the prospects, the existing condition and the outturn of the various crops were, for the first time, published during the year: this is an advance in the way of results which is satisfactory. The Director, however, complains of the difficulty experienced in obtaining the returns in proper time from Collectors. This was perhaps unavoidable at first, but there is now no reason why there should be delay in this matter, and the Board of Revenue should issue strict injunctions to District officers to observe punctuality and insist upon obedience to them; if this is done, there will soon be an improvement in this direction.

18. The total charges of the department, including the pay of the Director and the cost of the School of Agriculture, amounted to Rs. 57,698. The receipts were Rs. 47,933, of which Rs. 42,311 represent the contribution from the surplus pound funds.

19. *General.*—Government consider that, having regard to the elaboration of schemes which were in hand during the year, the effect of which can be only seen in the future and to the changes which have taken place in the officers who have had the direction of affairs, the progress of the department, has on the whole, been satisfactory. They would, however, impress upon the Director the desirability of the curtailment of the reports of his subordinates which are, especially in the case of that of the Assistant Director, more lengthy than was necessary. The long account given of the stock in the Saidápet Farm, for instance, was a needless waste of space: all that was requisite might have been given in a more condensed form. The same observation applies to the remarks on crops grown: nearly all the appendices to the report might, without sacrificing anything, have also been omitted. As, however, the farm has now passed beyond the purview of the Agricultural Department, the Assistant Director will probably be able, in coming reports, to be more brief. The information given at paragraph 4 of Mr. Mills' report was unnecessary and should, in future, be omitted.

The Director should arrange for the earlier submission of his report which has apparently been delayed on account of that of the Assistant Director. If the information required under each head is collected and written up during the year, putting this into shape at its close, need be but a brief operation.

(True Extract.)

(Signed) J. F. PRICE,
Ag. Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement and Agriculture.
,, the Government Botanist.
,, the Editors' Table.

No. 245-A.

Copy to the Government of India, Revenue and Agricultural Department.

(Signed) J. F. PRICE,
Ag. Secretary to Government.